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By WILLIAM CASTIEAU,

Teacher of the Mathematics, and Master of the Academy, opposite Berner's-street, in Oxford-street.

The other Articles by Gentlemen particularly conversant in the respective Subjects they have undertaken to explain.

VOLUME III.

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☞ *Those Articles which are marked thus * are totally omitted in every other Dictionary of Arts and Sciences.*

K.

K A L

K, The tenth letter of the alphabet, and a double consonant. It is borrowed from the Greek K, Kappa, which was made from the old Hebrew Caph, when reverted. It was but little used among the Latins; and Priscian says it was never used except in words borrowed from the Greek; we seldom indeed find it in Latin authors, except in *kalendæ*. This letter is formed in the voice by a guttural expression of the breath through the mouth, together with a depression of the lower jaw, and opening of the lips and teeth. It has much the same sound as the hard sound of C, and generally used only before i, e, and n, in the beginning of words, where the hard sound of C is formed, as in *kill*, *ken*, *knave*, &c. K is also a numeral letter, denoting 250. When it had a stroke at top, it stood for 250,000.

KÄMPFERIA, in botany, a genus of plants, the flower of which consists in a single petal, with a long slender tube, and the limb is divided into six segments: the fruit is a roundish and somewhat trigonal capsule, with three cells, each containing a considerable number of seeds. The roots of this plant are the galangals of the shops. See *Galangals*.

KALLI, glass-wort; in botany, a plant with spreading, reddish, pretty thick branches; oblong, narrow, pointed, fleshy leaves, like those of the house-leeks;

K A L

and imperfect flowers in the bosoms of the leaves, followed each by one seed spirally curled and inclosed in the cup. It is annual, and grows wild on the sea-coasts in the southern parts of Europe, particularly of the Mediterranean. This herb is very juicy, in taste bitterish, and remarkably saline. The expressed juice, and infusions or decoctions of the leaves, are said to be powerfully aperient and diuretic; and in this intention have by some been greatly recommended in hydropic cases: half a dram of the juice is reckoned a sufficient dose. But the kali is principally regarded on account of its yielding copiously, when burnt, the fixed alkaline salt called soda, or sonda: an impure soda is prepared from it about Montpellier, where the plant is said to be cultivated for this use in the salt marshes; and a purer kind at Alicant in Spain, from a somewhat different species of kali. The salt called kelp, prepared among ourselves from different marine plants, contains an alkali of the same kind, but more impure. The soda is much milder in taste than the common vegetable alkalies, and is in several other respects also very considerably different from them, being of the same nature with the mineral alkali or basis of sea-salt. It promises to be an useful article of the materia medica, and now begins to be introduced into practice in this country, as it has

KEE

long been among the French. Of the ashes of kali is made soap, glass, alkali-salt, pot-ash, &c. See *Soap, Glass, &c.*

The method of preparing it is as follows: when dry, they burn it in pits, dug in the ground, which are close covered up with earth, so that no air can come at the fire: by this means the matter is not only reduced to ashes, but made into a very hard stone, like rock salt, which they are forced to break with hammers to get it out. The best sort is in little dry stones, of a bluish grey colour, and full of little eyes or holes. See *Alkali*.

KAOLIN, the name of one of the two substances which are the ingredients of China ware. The other, which is called petunse, is easily vitrifiable, and this kaolin is scarce at all so. Whence the fire composes, from a mixture of them both, a semi-vitrification, which is china ware.

KEBLA, an appellation given by the Mahometans to that part of the world where the temple of Mecca is situated, towards which they are obliged to turn themselves when they pray.

KEDGE-ANCHOR, among sailors, a small anchor used in harbours and rivers, either to remove the ship from one place to another, by the help of certain transporting ropes, called warps, or to keep her steady as she rides at anchor, especially at the turn of the tide, when she may come so nigh as to entangle the hooks of it with her cable, if not kept from it by the kedge.

KEEL, in naval architecture, the principal piece of timber first laid upon the blocks, which supports the whole fabric of a ship in the same manner as the back-bone sustains the human body. When this cannot be had of a sufficient depth in one piece, there is a strong thick plank fastened to the bottom, called the false keel, which also serves to save the bottom of the main keel.

KEEL is also a vessel employed in divers parts of Northumberland to bring coals down the rivers to the ships, into which they discharge them for transportation: these vessels resemble the coal-barges on the river Thames, but are generally much stronger.

KEEPER of the Forest, an officer having the chief management of every thing belonging to a royal forest, as well as the government of all the other officers. See *Forest*.

KEEPER of the Great Seal, a lord by his office, is stiled lord-keeper of the great seal of Great Britain, and is always

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one of the privy council. All grants, charters, and commissions of the king under the great seal, pass through the hands of the lord-keeper, for without that seal, many of those grants, &c. would be of no force, the king being, in the interpretation of the law, a corporation, and therefore passes nothing but by the great seal, which is also said to be the public faith of the kingdom, being in the highest esteem and reputation. Whenever there is a lord-keeper, he is invested with the same place, authority, preheminance, jurisdiction, or execution of laws, as the lord chancellor of Great Britain is vested with.

KEEPER of the Privy Seal is also a lord by his office, through whose hands all grants, pardons, &c. pass before they come to the great seal; and even some things pass this officer's hands which do not pass the great seal. This officer is likewise one of the privy council, yet was anciently called clerk of the privy seal. His duty is to put the seal to no grant, &c. without a proper warrant, nor with warrant where it is against law, or inconvenient, but shall first acquaint the king therewith.

KELP, a fixed salt, or particular species of pot-ash, procured by burning the weed kali. See *Kali*.

* KENDALL, a market-town of Westmoreland, with a market on Saturdays, and two fairs, on May 6, for horned cattle, and November 8, for horned cattle, horses, and sheep. It is so called from its situation on the river Can, or Ken, and is a large town, well-built and populous, driving a considerable trade in the woollen manufacture. It had formerly a strong castle, parts of whose walls are yet standing. It has now a large church, and twelve chapels of ease. It was made a corporation first by queen Elizabeth, and afterwards by king James I. It consists of a mayor, twelve aldermen, twelve common council-men, and a recorder. Here is a good free-school, well endowed, with exhibitions to Queen's college, Oxford. This town is built in form of a cross, having two chief streets, or rather four, which meet at the middle of the town, placed at right angles. The tradesmen are divided into companies, namely, the mercers, sheermen, cordwainers, tanners, glovers, taylors, pewterers, &c. each of which have a place to meet in, to transact what relates to each particular company. It is sixty-six miles south-south-east of Carlisle, twenty-four north-north-west of Lan-

K E R

Lancaster, and two hundred and fifty-six on the same point from London. Long. 2. 40. W. Lat. 54. 15. N.

KENT (the county of) by the Romans called *Cantium*, is bounded on the east and part of the south by the sea, and on the other part by the county of Sussex, on the west by part of Surry, and on the north by the river Thames, all but a small part on the other side of that river opposite to Woolwich. It is in length fifty miles, and in breadth twenty-eight, and contains thirty-nine thousand two hundred and forty-two houses, four hundred and eight parishes, and thirty considerable towns. That part of the county lying upon the sea is not so healthy, nor has so good an air as the more distant parts, the inhabitants being very subject to agues. The soil is generally pretty rich and fruitful, but not so much near the Thames as the other parts. With regard to its productions, it differs little from other counties, though they have parks of fallow deer, and warrens of grey rabbits, but no red deer and black rabbits. They have no advantageous mineral except iron; but they have quarries of paving stone, and pits of marl and chalk. Besides the Thames, which bounds the county, they have several rivers and pleasant streams, particularly the Medway, the Derwent, and the Stour, which supply the inhabitants with plenty of fish and very fine oysters. Near Folkestone, upon the cliffs, there are very odd stones, some of which resemble a muscle, some a cockle, an almond, a screw, cock-spurs, and quills, which last are as transparent as amber; likewise there are some that resemble snakes, and have marks like spines and ribs. From this place to Dover there is a continual chain of chalky hills, for six miles together, among which is a cataract of water, which falls down from the cliffs, and is usually called the Liddal Spouts. Among these cliffs grows abundance of samphire, which is pretty much used as a salad. The towns that send members to parliament, besides the county, are Canterbury, Rochester, Maidstone, and Queensborough.

KERMES, round reddish brown grains, about the size of peas; found in Spain, Italy, and the southern parts of France, adhering to the branches of the scarlet oak. These grains appear, when fresh, full of minute reddish ova or animalcules, of which they are the nidus, and which in long keeping change to a brownish red powdery substance. They are cured

K E T

by sprinkling with vinegar before exsiccation: this prevents the exclusion of the ova, and kills such of the animals as are already hatched; which would otherwise become winged insects, and leave the grain an empty husk. French kermes yields upon expression a red juice, of a light pleasant smell, and a bitterish, subastrigent, somewhat pungent taste: the juice or syrup made from it are brought from the south of France, and sometimes made use of as mild restringents and corroborants. An elegant cordial confection, for these intentions, is prepared in the shops, by dissolving in the heat of a water bath, six ounces of fine sugar in six ounces by measure of damask rose water, then adding three pounds of the juice of kermes, warmed and strained, and after the whole has grown cold, mixing in half a scruple of oil of cinnamon: this confection is taken from a scruple to a dram, or more, either by itself or in juleps, with which it mingles uniformly, without injuring their transparency.

KERMES MINERAL. The kermes mineral was a preparation of Glauber, which the king of France bought of Mr. de la Ligerie, and made public in 1720. Half a grain, or a grain of this powder, given every three or four hours, produces no violent effects; but, by increasing the dose, it may be made to vomit, purge, and sweat. Some commend this medicine as the most universal resolvent and deobstruent; assuring us, that it almost infallibly cures pleuresies, peripneumonies, asthmas, catarrhs, aginæ, small-pox, and many other diseases. Others are as positive, that it heats and thickens the blood, thereby increasing obstructions, and is particularly hurtful in all inflammatory diseases.

KESTRIL, or KASTRIL, in ornithology, the yellow legged falcon, with a brown back, a spotted breast, and a rounded tail, with a broad black fascia towards the end. It is a very beautiful bird, about the size of a pigeon, and very bold. It is known, among authors, by the names of *tinnunculus* and *ecthris*; and is also called in English, the *stannel* or *windhover*.

KETCH, in the marine, a vessel with two masts, viz. a main and mizen mast. The principal use of this sort of ships is to bombard a place, being properly furnished with mortars, bombs, carcasses, &c. for this employment, and built remarkably strong to encounter the shock of firing shells for a continuance.

KET-

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KETTLE-DRUMS, in the art of war. See *Drum*.

KEY, *Clavier*, a well known instrument for opening and shutting the locks of doors, chests, bureaus, and the like. The names of the several parts of a key are these: A (plate XXV. fig 2.) is the pin-hole, drilled into the end of the shank H; B is the step, or dap-ward; C, the hook-ward; D, the middle ward; E E, the cross-ward; F, the main ward; G G, cross-ward; I, the pot; K, the bow-ward; L, the bow, or handle; and B F E D, &c. the piece of steel, containing the wards, is called the bit of the key.

KEY, in music, a certain fundamental note, or tone, to which the whole piece, be it in concerto, sonata, cantata, &c. is accommodated, and with which it usually begins, but always ends.

KEY is also used for an index, or explanation of a cipher.

KEYS likewise denote those little pieces in the fore-part of an organ, spinnet, or harpsicord, whereby the jacks are played, so as to strike the strings of the instrument, and wind is given to the pipes by raising and sinking the sucker of the sound-board.

KEY-STONE, *cf on Arch, or Vault*, that placed at the top or vertex of an arch, to bind the two sweeps together.

KIDNIES, *Renes*, in anatomy, two pretty solid, glandular bodies, situated in the posterior part of the cavity of the abdomen, on each side of the lumbar vertebrae, between the last false ribs and ossa ilium. The right kidney lies under the great lobe of the liver, and is consequently lower than the left, which lies under the spleen. The figure of the kidney resembles that of a large bean, being convex on one side, and concave on the other; the concave side is turned to the vertebrae, and the convex the opposite way. Their length answers to the distance between the last false rib and ossa ilium; they are about half as broad as long, and half as thick as broad.

KILDERKIN, a liquid measure containing two firkins.

KINDRED, in law, persons related to others, whereof the law of England reckons three degrees or lines, viz. the descending, ascending, and collateral line. On there being no kindred in the descending line, the inheritance passes to the collateral one.

KING, in the general acceptation of the word, a person who has a supreme authority, with the power of levying taxes,

K I N

making laws, and enforcing an obedience to them: but in England, which is a limited monarchy, the power of the king is greatly restrained; which is so far from diminishing his honour, that it adds a glory to his crown; for while other kings are absolute monarchs over innumerable multitudes of slaves, the king of England has the distinguished glory of governing a free people, the least of whom is protected by the laws: he has great prerogatives, and an unlimited power in doing good; and is at the same time only restrained from acting inconsistently with his own happiness, and that of his people. He has all the ensigns of royalty, and all the marks of sovereignty: but while he has the power of making treaties, of sending and receiving ambassadors, of conferring titles, creating privy counsellors, officers of state, and judges, may raise men and arms both for sea and land, he cannot force his subjects to maintain them, or raise one tax by his sole authority: he has the privilege of coining money, but he cannot force the meanest subject to part with his property; he can pardon a criminal, but he cannot put a subject to death till he is condemned by his peers: he may at his pleasure call, continue, prorogue, and dissolve parliaments, and without his royal assent no bill in parliament can pass into a law; yet he can neither act contrary to law, nor make new laws by his sole authority; on the contrary, he may even be sued and cast in his own courts.

KING'S BENCH, a court held in Westminster-hall, so called, because the king is supposed to sit in person as judge of the court, and may do so whenever he pleases; wherefore all writs, &c. in this court are made returnable *coram nobis*, and not *coram iudiciariis nostris*, as in the Common Pleas. The judges are the lord chief justice, and three other puisne justices. Here are principally determined matters relating to the crown and the peace. When any are aggrieved by an order of justices or quarter sessions, they have recourse hither: the rights of election of mayors, bailiffs, constables, &c. are, upon mandamus's, settled here, and prohibitions issued to stay proceedings in the ecclesiastical, admiralty, or other inferior court. Here any debt or contract may be sued for, as well as in any other court.

Books of KINGS, two canonical books of the Old Testament, so called because they contain the history of the kings of Israel and Judah, from the beginning of the

the reign of Solomon down to the Babylonish captivity, for the space of near six hundred years. The first book of Kings contains the latter part of the life of David, and his death; the flourishing state of the Israelites under Solomon, his building and dedicating the temple of Jerusalem, his shameful defection from the true religion, and the sudden decay of the Jewish nation after his death, when it was divided into two kingdoms: the rest of the book is taken up in relating the acts of four kings of Judah, and eight of Israel. The second book, which is a continuation of the same history, is a relation of the memorable acts of sixteen kings of Judah, and twelve of Israel, and the end of both kingdoms, by the carrying of the ten tribes captive into Assyria by Salmanassar, and the other two into Babylon by Nebuchadnezzar. It is probable that these books were composed by Ezra, who extracted them out of the public records which were kept of what passed in that nation.

KING'S FISHER, *Ispida*, in ornithology.

* **KING'S SPEECH**, the first that was delivered was in 1107, by Henry I.

KIRK, a Saxon term, signifying the fame with church.

KIRK-SESSIONS, an inferior church-judicatory, in Scotland, consisting of the ministers, elders, and deacons of a parish.

KITCHEN-GARDEN, a piece of ground laid out for the cultivation of fruit, herbs, pulse, and other vegetables used in the kitchen. A kitchen-garden ought to be situated on one side of the house, near the stables, from whence the dung may be easily conveyed into it; and after having built the walls, borders should be made under them, which, according to Miller, ought to be eight or ten feet broad: upon those borders exposed to the south, many sorts of early plants may be sown; and upon those exposed to the north, you may have some late crops, taking care not to plant any sort of deep-rooting plants, especially beans and peas, too near the fruit-trees. You should next proceed to divide the ground into quarters; the best figures for these is a square, or an oblong, if the ground will admit of it; otherwise they may be of that shape which will be most advantageous to the ground; the size of these quarters should be proportioned to that of the garden; if they are too small, your ground will be lost in walks, and the quarters being inclosed by espaliers of fruit-trees, the plants will draw up slender,

for want of a more open exposure. The walks should also be proportioned to the size of the ground; these in a small garden should be six feet broad, but in a larger one ten; and on each side of the walk there should be allowed a border three or four feet wide, between it and the espalier, and in these borders may be sown some small fallads, or any other herbs that do not take deep root, or continue long; but these quarters should not be sown or planted with the same crop two years together. In one of these quarters, situated nearest to the stables, and best defended from the cold winds, should be the hot-beds, for early cucumbers, melons, &c. and to these there should be a passage from the stables, and a gate through which a small cart may enter. The most important points of general culture consist in well digging and manuring the soil, giving a proper distance to each plant, according to their different growths, as also in keeping them clear from weeds; for this purpose you should always observe to keep your dung-hills clear from them; if this is not done, their feeds will be constantly brought in, and spread with the dung.

KNAVE, in old law books, an appellation given to a man servant, or even to a male child.

KNEE, *Genu*, in anatomy, the articulation of the thigh and leg bones.

KNEE of the Head, in ship-building, a large piece of timber sayed and bolted to the stem, on which the figure or image of the head rests. This is commonly called cut-water by seamen.

KNEES, in ship-building, certain crooked pieces of timber, one leg or arm of which is bolted to the beams, and the other to the ship's side.

KNIGHT, *Eques*, among the Romans, a person of the second degree of nobility, following immediately that of the senators.

KNIGHT, a person who, on account of some martial feat, or notable action, is by the king raised to a rank above a gentleman. The original High Dutch word *knecht*, signifies a servant, as we find is still meant by knight of the shire; and afterwards it denoted a military man, or horseman, as being usually employed on horseback. In our common law, they are called *milites*, as commonly holding lands in knight-service to serve the king in his wars.

KNIGHT, a person admitted into any order, with certain marks of distinction, as the knights of the garter, of the Bath, of

of the elephant, of the thistle, of the Holy Ghost, Malta, &c.

KNIGHTS-ERRANT, a pretended order of chivalry, much talked of in old romances, being a kind of heroes that travelled in search of adventures, redressing wrongs, rescuing damsels, and taking all occasions of signalizing their prowess. Of this kind of knights was Don Quixote, the hero of a celebrated romance, known by that name. This romantic bravery of the old knights was heretofore the chimera of the Spaniards.

KNIGHTS of the Shire, or **KNIGHTS of Parliament**, in the British polity, are two knights or gentlemen of estate, who are elected, on the king's writ, by the freeholders of every county, except in Wales, to represent them in parliament.

The qualifications of a knight of the shire, is to be possessed of 600 l. per ann. in a freehold estate. Their expences during their sitting, were, by a statute of Henry VIII. to be defrayed by the county; but this is now scarce ever required.

*** KNIGHTHOOD**, was first instituted in England in the year 540.

KNIGHT-MARSHAL, an officer in the king's household, who has jurisdiction and cognizance of any transgression within the king's household and verge; as also of contracts made there, whereof one of the house is party.

KNOTTING, among sailors, untwisting the ends of a rope, and interweaving them curiously amongst each other, so as to form knots of various shapes; amongst which they number the diamond-knot, the wall-knot, or walnut, the rose-knot, bowline-knot, double diamond-knot, &c.

KNOWLEDGE, according to Mr. Locke, consists in the perception of the connection and agreement, or disagreement and repugnancy of our ideas: and so it stands contradistinguished from ignorance. Whatever comes short of intuition and demonstration, is but faith or opinion, not knowledge. As we are invincibly conscious to ourselves of a different perception, when we look on the sun in the day, and think on it by night, we may add to the two former sorts of knowledge this also of the existence of particular external objects by that consciousness we have of the actual entrance of ideas from them; so that there is a third degree of knowledge, which may be called sensitive.

Extent and Limits of Human KNOWLEDGE. 1. It is evident that we can have no knowledge farther than we have

perception of the agreement or disagreement of our ideas, whether by intuition, demonstration, or sensation. 2. We cannot have an intuitive knowledge that shall extend itself to all our ideas and all that we know about them, because we cannot examine and perceive all the relations they have to each other; thus we cannot intuitively perceive the equality of two extensions, the difference of whose figures makes their parts incapable of an exact immediate application. 3. Demonstrative knowledge cannot reach to the whole extent of our ideas, because we cannot always find such proofs as will connect them together, with an intuitive knowledge in all the parts of the deduction. Thus, though we have the ideas of a square, a circle, and equality, yet we, perhaps, shall never be able to find a square exactly to a circle. The affirmations, or negations we make concerning the ideas we have, being reduced by Mr. Locke to these four, viz. identity, co-existence, relation, and real existence, he examines how far our knowledge extends to each of these.

1. As to identity and diversity, our intuitive knowledge is so far extended as our ideas themselves, and there can be no idea in the mind which it does not presently, by an intuitive knowledge, perceive to be what it is, and to be different from any other.

2. As to the agreement or disagreement of our ideas of co-existence, our knowledge herein is very defective, though the greatest and most material part of our knowledge concerning substances consists in it.

As to the powers of substances, which make a great part of our enquiries about them, our knowledge reaches little further than experience, because they consist in a texture and motion of parts which we cannot by any means come to discover.

3. As to the third sort, the agreement or disagreement of our ideas in any other relation; this is the largest field of knowledge, and it is hard to determine how far it may extend. This part depending on our sagacity in finding intermediate ideas, that may shew the habitudes and relations of ideas, it is difficult to tell when we are at an end in such discoveries.

4. As to the fourth part of knowledge, viz. of the real actual existence of things, we have an intuitive knowledge of our own existence, a demonstrative knowledge of the existence of God, and a sensitive

lative knowledge of the objects that present themselves to our senses. See the article *Existence*.

Reality of Human KNOWLEDGE. It is evident, says Mr. Locke, that the mind knows not things immediately, but by the intervention of the ideas it has of them. Our knowledge therefore is real only so far as there is a conformity between our ideas and the reality of things. But how shall we know when our ideas agree with things themselves? It is answered, there are two sorts of ideas that we may be assured agree with things: these are,

1. Simple ideas; which, since the mind can by no means make to itself, must be the effect of things operating upon the mind in a natural way, and producing therein those perceptions which, by the will of our Maker, they are ordained and adapted to. Hence it follows, that simple ideas are not fictions of our fancies, but the natural and regular productions of things without us really operating upon us, which carry with them all the conformity our state requires, which is to represent things under those appearances they are fitted to produce in us. Thus the idea of whiteness, as it is in the mind, exactly answers to that power which is in any body to produce it there. And this conformity between our simple ideas and the existence of things, is sufficient for real knowledge. See *Idea*.

2. All our complex ideas, except only those of substances, being archetypes of the mind's own making, and not referred to the existence of things as to their originals, cannot want any conformity necessary to real knowledge.

3. But the complex ideas which we refer to archetypes without us, may differ from them, and so our knowledge about them may come short of being real, and such as are our ideas of substances. These must be taken from something that does or has existed, and not be made up of ideas arbitrarily put together, without any real pattern. Herein, therefore, is founded the reality of our knowledge concerning substances, that all our complex ideas of them must be such, and such only, as are made up of single ones, as have been discovered to co-exist in nature; and our ideas being thus true, though not perhaps very exact copies, are the subjects of real knowledge of them. Whatever ideas we have, the agreement we find they have with others, will be knowledge: if those ideas be ab-

stract, it will be general knowledge; but to make it real concerning substances, it must be taken from the real existence of things: wherever therefore, we perceive the agreement or disagreement of our ideas, there is certain knowledge; and wherever we are sure these ideas agree with the reality of things, there is certain real knowledge.

Improvement of Human KNOWLEDGE. The way to improve in knowledge, is not to swallow principles with an implicit faith, and without an examination, which would be apt to mislead men, instead of guiding them into truth; but to get and fix in our minds clear and complete ideas, as far as they are to be had, and annex to them proper and constant names, and thus barely by considering our ideas, and comparing them together, and observing their agreement or disagreement, their habitudes and relations, we shall get more true and clear knowledge by the conduct of this one rule, than by taking up principles, and thereby putting the mind into the disposal of others.

We must therefore, if we proceed as reason advises, adapt our methods of enquiry to the nature of the ideas we examine, and the truth we search after. General and certain truths are only founded in the habitudes and relations of abstract ideas; therefore a sagacious methodical application of our thoughts, for the finding out these relations, is the only way to discover all that can with truth and certainty be put into general propositions. By what steps we are to proceed in these, is to be learned in the schools of the mathematicians, who from very plain and easy beginnings, by gentle degrees, and a continued chain of reasonings, proceed to the discovery and demonstration of truths, that appear at first sight above human capacity. This may reasonably be said, that if other ideas, that are real as well as nominal essences of their species, were pursued in the way familiar to mathematicians, they would carry our thoughts farther, and with greater evidence and clearness, than probably we are apt to imagine.

In our knowledge of substances, we are to proceed in quite a different method; the bare contemplation of their abstract ideas, which are but nominal essences, will carry us but a very little way in the search of truth and certainty: here experience must teach us what reason cannot; and it is by trying alone that we

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can certainly know what other qualities co-exist with those of our complex idea; for instance, whether that yellow, heavy, fusible body we call gold, be malleable or not, which experience, however it prove in that particular body we examine, makes us not certain that it is so in all or any other yellow, heavy, fusible bodies, but that which we have tried; because it is no consequence, one way or other, from our complex idea. As far as our experience reaches, we may have certain knowledge, and no farther. It is not denied, but that a man, accustomed to rational and regular experiments, shall be able to see farther into the nature of bodies, and their unknown properties, than one that is a stranger to them; but this is only judgment and opinion, not knowledge and certainty. This makes our author suspect that natural philosophy is not capable of being made a science from experiments and historical observations: we may draw advantages of ease and health, and thereby increase our stock of conveniences for this life; but beyond this, he fears, our talents do not reach, and guesses that our faculties are not able to advance farther. See *Experimental Philosophy*.

* KNOX (JOHN) a celebrated minister of Scotland, and one of the chief instruments of the reformation in his own country. He had been the disciple of John Major, doctor of the Sorbonne, and one of the most acute schoolmen of those times; but having discovered a vast number of errors, and published a confession of faith, which made him pass for an heretic, he was imprisoned, and would have lost his life at the place of execution, had he not been so happy as to make his escape, and fly into England, where he was so much esteemed by king Edward, that he might have been promoted to a bishopric, but he refused it with indignation, alledging that the pomp of episcopacy was nothing to the gospel. After the death of that prince, he retired to Frankfort, and afterwards to Geneva, where he contracted a strict friendship with Calvin. In 1559 he returned to Scotland, and laboured with extraordinary zeal to establish there the doctrine of the protestants, by his preaching and writings, and died on the 24th of November, 1572, in the sixty-seventh year of his age. His *History of the Reformation*, was printed with his other works at Edinburgh, in 1732, in folio.

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By an unwearied application to study and to business, as well as by the frequency and fervour of his public discourses, he had worn out a constitution naturally strong. During a lingering illness, he discovered the utmost fortitude; and met the approach of death with a magnanimity inseparable from his character. He was constantly employed in acts of devotion, and comforted himself with those prospects of immortality, which not only preserve good men from desponding, but fill them with exultation in their last moments. The earl of Morton, who was present at his funeral, pronounced his eulogium in a few words, the more honourable for Knox, as they came from one, whom he had often censured with peculiar severity. "Here lies he, who never feared the face of man."

KORAN, or ALCORAN. See *Alcoran*.

* KOULI KHAN (THAMAS) or Nadir Schah, tyrant of Persia, was born in the province of Chorazan, in Persia, in the year 1687. His father, who was a shepherd, bred him to the same employment; but being soon weary of that humble and honest situation, he stole 700 of his father's sheep, sold them at Meshed, and then assembled a number of lawless fellows, put himself at their head, and began to rob caravans. This method of life he continued seven years, and acquiring great riches by his robberies, had under his command 6000 resolute villains, well armed, well disciplined and practised to slaughter. Having thus rendered himself extremely formidable, he offered his services to Schah Thamas, whose throne was then filled by Eschref, an usurper, proposing to deliver his country from the Aghwans, who had, during five years, lorded it over the Persians with the utmost barbarity. When Thamas giving him the command of his army, he entirely defeated the numerous forces of Eschref; conducted the Schah Thamas in triumph to Isfahan, and placed him on the throne of his ancestors. Mean while, Eschref having got together all his treasures and his women, Nadir, at the head of 15,000 men, went in pursuit of him, having first advised his prince to march against the Turks with the rest of the army, promising that as soon as he had secured Eschref, he would come to his assistance. He at length came up with the Aghwans, great part of whom were soon cut to pieces, and the rest taken

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ken prisoners; among the latter was Eschref, whose treasures fell into the hands of the victor. He ordered the eyes of the usurper to be put out, and some days after caused him to be beheaded. The money, which amounted to six millions in specie, he distributed among the soldiers, and thus by his liberality secured their affections; but the jewels, which were of inestimable value, he took to himself. He then reduced the province of Candahar, obliged the Great Mogul to restore what he had taken during the troubles of Persia, and then hastened back to succour his prince, whom he supposed to be engaged with the Turks; but on his approaching Ispahan, he was surprized to find that he had concluded a peace with the Porte, disbanded his army, and sent him orders to do so too. Filled with indignation, he exclaimed against the ignominious peace, and the effeminacy of his prince, and instead of disbanning his army, which now amounted to 70,000 men, he marched to Ispahan, seized the Schah Thamas, whom he imprisoned in a strong fortress, and in an assembly of the chiefs of Persia got him deposed, and his son, an infant only six months old, was proclaimed king, by the name of Schah Abbas III. In the name of this infant, Nadir assumed the sovereign power, and issuing a manifesto, in which he disclaimed the late peace with the Turks, marched towards the frontiers of Turkey. This war continued three years, in which he displayed the greatest military talents, and obtained the most signal victories, and recovered all that had been taken from Persia. He then, in 1736, concluded a peace with the Ottoman Porte, and the young Schah Abbas dying the next year, he resolved to ascend the throne. He therefore assembled the chief men of the kingdom,

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and before them enumerated the great services he had done to his country; and adding that he designed to resign the regency, and to spend the remainder of his days in retirement, recommended to them to choose a new Schah or king. He then retired, when some of his creatures proposed their petitioning him to accept the Persian diadem, which was readily agreed to, as they were surrounded by an army of 100,000 men, entirely devoted to their general; not the least objection was offered, except by the high-priest, who was soon silenced by the bow-string; and the next day Nadir was proclaimed Schah with all testimonies of public joy. He immediately marched with his victorious army against the Mogul, and in one single battle conquered almost his whole empire. In this expedition his army slew above 200,000 men, and brought away a treasure worth above 2,400,000 l. among which was the imperial throne, set with diamonds of immense value. He now resolved to chastize the Usbec Tartars, who, during all his wars, had been his secret enemies. He twice defeated them, took Buchara, their capital, by storm, and conquered the whole country. Thus, by taking from the Mogul all the country between the former limits of Persia and the river Indus, and by subduing Usbec Tartary, he greatly enlarged the bounds of his empire. He now fell into a state which bordered on distraction, he endeavoured to change the religion of Persia to that of Omar, hanged the chief-priests, put his own son to death, and was guilty of innumerable acts of wanton cruelty; but was at length assassinated in 1747, in the 60th year of his age, after having reigned above twenty years.

KUTUCHTA, among the Calmuc Tartars, the name of their high-priest, or sovereign pontiff,

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L, A semi-vowel, or liquid, being the eleventh letter in the alphabet.

It was derived from the old Hebrew Lamed, or Greek Lambda λ. In English words of one syllable it is doubled at the end, as *swell, sell, bell, knell*, &c. but in words of more syllables than one it is single at the end, as *evil, general, constitutional*, &c. It is placed after most of the consonants in the beginning of words and syllables, as *clack, glare, ad-le, eagle*, &c. but before none. Its sound is clear in *Abel*, but obscure in *able*, &c.

L, among the ancients, was a numeral letter, and is still so in the Roman cyphering, and denotes fifty. When a line was written at top **L**, it stood for 50,000.

LABARUM, in Roman antiquity, the standard borne before the Roman emperors; being a rich purple streamer, supported by a spear.

LABDANUM, or LADANUM, a resinous juice, exuding upon the leaves of a small shrub, which grows plentifully in Candy, and some of the other islands of the Archipelago. The shrub is said to be very plentiful also in Spain, but it does not appear that any labdanum is brought from thence. Two sorts of this resin are met with in the shops. The best, though very rare, is in dark coloured black masses, of the consistence of a soft plaster, growing still softer on being handled: the other is in long rolls coiled up, much harder than the preceding, and not so dark. The first has commonly a small, and the last a very large admixture of fine sand, which in the labdanum examined by the French academy, amounted to three fourths of the mass. It is scarcely indeed to be collected pure, independently of designed abuses; the dust blown on the plant by winds from the loose sands among which it grows being retained by the tenacious juice. Labdanum has been sometimes exhibited as a resinous corroborant and restringent, but principally employed in external applications and perfumes: the soft kind makes an useful ingredient in the cephalic and stomachic plasters of the shops. This sort has a very agreeable smell, and a lightly pungent bitterish taste: the hard is much

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weaker; and the common means of purifying these kinds of substances, though they separate the sandy matter mixed with it, render it weaker still.

LABEL, in heraldry, a fillet generally placed in the middle, along the chief of the coat, without touching its extremities. Its breadth ought to be a ninth part of the chief. It is adorned with pendants; and when there are above three of these, the number must be specified in blazoning. This is a kind of addition to the arms of a second brother, to distinguish him from the first, and is esteemed the most honourable of all differences.

LABEL, in law, a narrow slip of parchment hanging from a deed, or other writing, to hold the appending seal.

LABEL of a Circumferentor, a long thin brass ruler, with a sight at one end, and a center-hole at the other; chiefly used with a tangent line, to take altitudes.

LABIAL LETTERS, those pronounced chiefly by means of the lips.

LABIATED FLOWERS, monopetalous flowers, consisting of a narrow tube, with a wide mouth, divided into two or more lips.

LABORATORY, or ELABORATORY. See *Elaboratory*.

LABOUR, a close application to work or business. Among seamen, a ship is said to be in labour, when she rolls and tumbles very much, either a hull, under fail, or at anchor. It is also spoken of a woman in travail, or child-birth.

LABOURING, in the marine, a violent rolling or pitching, so as to endanger the masts and hull, by carrying away or springing the former, and straining the latter, so as to occasion a leak or other disaster.

* LABRADOR, called also New BRITTAIN and ESQUIMAUX, a country in North America, between fifty and sixty-four degrees of north latitude, bounded by Hudson's Streights and the North Sea on the north, by the same sea on the east, by the river of St. Lawrence and Canada on the south, and by Hudson's Bay on the west. It is inhabited in the winter by a people called the Esquimaux, though in the summer time they make

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make an excursion from hence to the sea coasts of Newfoundland, and have been seen as far as Nelson's river, which rises in the west, and falls into Hudson's bay. These people are properly savages, for they eat raw flesh, and have a thick beard which covers their faces up to their eyes, insomuch that their features can hardly be discovered; their hair is generally black and rugged, their eyes little and wild, and their whole external appearance frightful and ugly. They are tall and pretty well shaped; however, it appears from their whole aspect, that they are of a different original from the other Americans. They are so well clothed, that there is nothing to be seen but part of their faces and their fingers ends; their inward garment is a sort of shirt, made of bladders, or the guts of fishes, cut in pieces and sewed together; over this they have a kind of loose coat, made of a bear skin, or of some other wild beast, and sometimes those of birds; they have a hood of the same stuff as the shirt, and fastened to it: the shirt reaches no lower than the hip, but the coat falls down behind as far as their thighs, and before a little below their girdles; that of the women descends as low as the mid leg, and is fastened with a girdle, from which hang a great many little bones; the men have breeches of skins, with the hair inward, and on the outside they are covered with the skins of small animals; on the feet they have sandals, with the hair on the inside, over which they have boots, with the fur disposed in the same manner; then another pair of sandals, which are sometimes tripled and quadrupled: however this dress does not prevent them from being very swift of foot. Their arrows, which are their only weapons, are pointed with the teeth of sea-cows, or with iron, when they can get it; in the summer they are always abroad in the open air; but in the winter they lodge in holes made in the earth. It was never possible to civilize any of them, for they will not come near the Europeans, nor eat any thing which comes from them.

LABYRINTH, in anatomy, the internal cavity of the ear, so called from its sinuosities and windings.

LABYRINTH, in gardening, a winding, mazy, and intricate turning to and fro, through a wilderness, or a wood. The design of a labyrinth is, to cause an intricate and difficult labour to find out the center; and the aim is, to make the

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walks so intricate, that a person may lose himself in them, and meet with as great a number of stops and disappointments as possible, they being the most valuable that are most intricate. As to the contrivance of them, it will not be possible to give directions in words: there are several plans and designs in books of gardening: they are rarely met with but in great and noble gardens, as Hampton Court, &c.

LACCA, LAC, or STICK-LACK, improperly called gum-lac, in natural history, a concrete brittle substance, of a dark red colour; brought from the East Indies incruited on pieces of sticks; internally divided into several cells: said to be the resinous juice of certain trees, collected by winged red insects of the ant kind, impregnated with the tinging matter of the insects, and by them deposited either on the branches of the trees, or on sticks fastened in the earth for that purpose. In the cells are often observed small red bodies, which appear to be the young insects. The tinging red animal matter of the stick-lac dissolves both in water and in rectified spirit, and appears to be of the same general nature with that of cochineal; like which it is made dull by alkalies, and brighter by acids, and turned to a scarlet by a solution of tin.

A spirituous tincture of stick-lac has been sometimes given as a mild restraining and corroborant, in female weaknesses; and in rheumatic and scorbutic disorders. But the principal medicinal use of this concrete is as a topical corroborant and antiseptic, in laxities and scorbutic bleedings and exulcerations of the gums; some employ for this purpose a tincture of the lac in alum water; others, a tincture made in vinous spirits impregnated with the pungent antiscorbutics: an ounce of the powdered lac, with half an ounce of the powdered myrrh, is by the college of Edinburgh directed to be digested in a sand heat for six days, in a pint and a half of spirit of scurvy-grass.

Artificial LACCA, or LAKE, in painting, a white earthy body, as cuttle-fish bone, the basis of alum, or chalk, tinged with some crimson vegetable dye, such as is obtained from cochineal or Brazil wood, dissolved or taken up by means of some alkaline salt, precipitated on the earth by the addition of some acid. Lake is used in all kinds of painting, except enamel; but particularly in oil, where it supplies the place of carmine, which

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which does not at all agree with that vehicle. It is valuable both for its brightness and crimson tint; which make it useful for carnations to the portrait painters, for skies to the landscape or ship painters, and for flowers to those who paint still life. Its transparency in oil renders it also of great service in glazing, as it is called, over vermilion, and in painting scarlet draperies, and the red parts of the lips; and its acquiring a dark hue, by this transparency, when used without the addition of any opaque pigment, gives it an unrivalled excellence in the shades of red draperies, or other similar cases. Besides the perfections of lake, which it may have in common with other colours, there is yet another that relates only to itself, which is the inclining to the scarlet hue, that makes it more valuable for almost all the purposes to which it is applied; and where this quality, joined to the others, happens to be found in it, there is scarcely any limits to be set on its value with eminent painters of any kind.

Lake was most probably first made from the colour found in the grains of the slick-lac, from whence it seems to have taken its name; but it may be made from a great variety of substances which afford a crimson tinge: though at present it is seldom prepared from any other than cochineal, scarlet rags, and Brazil wood.

* **LACEDEMON**, a city of Turkey in Europe, in the peninsula of the Morea, which is the ancient Peloponnesus; it is seated on the river Eurotas, thirty miles north of the Sinus Laconicus, and sixty miles south of Corinth. Here are still the ruins of several magnificent Grecian temples, and there are some traces of the grove where the Spartans performed their wrestling, races, and other exercises. Long. 23, 31 E. Lat. 36, 45 N.

* **LACHESIS**, in fabulous history, the youngest of the three Parcae or Destinies. She holds the distaff whilst her sister Clotho spins the thread of life, which Atropos cuts off.

LACHRYMAL, in anatomy, an appellation given to several parts of the eye, from their serving to secrete the tears.

LACHRYMATORY, in antiquity, a vessel wherein were collected the tears of a deceased person's friends, and preserved along with the ashes and urn.

LACONISM, in matters of style, a short, pithy observation or saying; so

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called from the Lacedæmonians, who were remarkable for the conciseness of their discourse.

LACTEAL VESSELS, in anatomy, long slender tubes for the conveyance of the chyle from the intestines to the common reservoir.

LACTIFEROUS PLANTS, in botany, such plants as abound with a milky juice, as the lithymalus, sonchus, and lettuce.

LADY'S BEDSTRAW, a plant called by botanists gallium. See *Gallium*.

LADY'S COMB, a plant otherwise called scandix. See *Scandix*.

LADY'S FINGER, a species of vulneraria. See *Vulneraria*.

LADY'S MANTLE, the English name of alchimilla. See *Alchimilla*.

LADY'S SMOCK, the English name of cardamine. See *Cardamine*.

LADY'S SLIPPER, the English name of the cypripedium. See *Cypripedium*.

LADY-DAY, in law, the 25th of March, being the annunciation of the Holy Virgin.

* **LAFFELDT**, *Battle of* (July 20, 1747) The duke of Cumberland took post with his whole army between the two Nethe, to cover Bergen-op-Zoom and Maestricht; and Marschal Saxe called in his detachments, with a view to hazard a general engagement. In the latter end of May the French king arrived at Brussels, and his general resolved to undertake the siege of Maestricht. For this purpose he advanced towards Louvain; and the confederates perceiving his drift, began their march to take post between the town and the enemy. On the twentieth day of June they took possession of their ground, and were drawn up in order of battle, with their right at Bilson, and their left extending to the Wirt, within a mile of Maestricht, having in the front of their left wing the village of Laffeldt, in which they posted several battalions of British infantry. The French had taken possession of the heights of Hurdeeren, immediately above the allies, and both armies cannonaded each other till the evening. In the morning the enemy's infantry marched down the hill in a prodigious column, and attacked the village of Laffeldt, which was well fortified, and defended with surprizing obstinacy. The assailants suffered terribly in their approach, from the cannon of the confederates, which was served with surprizing dexterity and success; and they met with such

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a warm reception from the British musketry as they could not withstand: but when they were broken and dispersed, fresh brigades succeeded with astonishing perseverance. The confederates were driven out of the village; yet being sustained by three regiments, they measured back their ground, and repulsed the enemy with great slaughter: nevertheless, count Saxe continued pouring in other battalions, and the French regained and maintained their footing in the village, after it had been three times lost and carried. The action was chiefly confined to this post, where the field exhibited a horrible scene of carnage. At noon the duke of Cumberland ordered the whole left wing to advance against the enemy, whose infantry gave way: prince Waldeck led up the centre, marshal Bathiani made a motion with the right wing towards Herdeeren, and victory seemed ready to declare for the confederates; when the fortune of the day took a sudden turn to their prejudice. Several squadrons of Dutch horse, posted in the centre, gave way, and flying at full gallop, overthrew five battalions of infantry that were advancing from the body of reserve. The French cavalry charged them with great impetuosity, increasing the confusion that was already produced, and penetrating through the lines of the allied army, which was thus divided about the centre. The duke of Cumberland, who exerted himself with equal courage and activity, in attempting to remedy this disorder, was in danger of being taken; and the defeat would, in all probability, have been total, had not Sir John Ligonier taken the resolution of sacrificing himself and a part of the troops to the safety of the army. At the head of three British regiments of dragoons, and some squadrons of imperial horse, he charged the whole line of the French cavalry with such intrepidity and success, that he overthrew all that opposed him, and made such a diversion as enabled the duke of Cumberland to effect an orderly retreat to Maestricht. He himself was taken by a French carabineer, after his horse had been killed; but the regiments he commanded retired with deliberation. The confederates retreated to Maestricht, without having sustained much damage from the pursuit, and even brought off all their artillery except sixteen pieces of cannon. Their loss did not exceed six thousand men killed and taken; whereas the French general purchased the victory at a much

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greater expence. The common cause of the confederate powers is said to have suffered from the pride and ignorance of their generals. On the eve of the battle, when the detachment of count de Clermont appeared on the hill of Herdeeren, marshal Bathiani asked permission of the commander in chief to attack them before they should be reinforced, declaring he would answer for the success of the enterprise. No regard was paid to this proposal: but the superior asked in his turn where the marshal should be, in case he was wanted? He replied, "I shall be always found at the head of my troops," and retired in disgust. The subsequent disposition has likewise been blamed, inasmuch as not above one half of the army could act, while the enemy exerted their whole force.

LAGOECIA, round-headed cummin, in botany. This plant has neither the smell, appearance, or taste of cummin; its smell being more like that of the carrot.

LAIR, among sportsmen, the place where the deer harbour by day. This term is also used to signify a place where cattle usually rest under some shelter: by which means the ground generally becomes enriched with their dung.

*** LAIS**, a celebrated courtesan, was born at Hyccara, in Thessaly. Her country being plundered by Nicias, she was carried to Greece, and settled at Corinth, one of the most licentious cities in the world. Lais's beauty was so much extolled in Greece, that princes, nobles, orators and philosophers, conceived a passion for her. It is said, that Demosthenes went secretly to Corinth, on purpose to spend a night with her, but that Lais having demanded ten thousand drachmas, he returned back, saying, "he would not buy repentance at so dear a rate."

Diogenes the Cynic had a particular affection for her. The philosopher Aristippus spent a great part of his fortune upon her. It is nevertheless said, that she did not love him, and being rallied upon it, he replied, "I do not think the wine and fish love me, and yet I feed upon them with great pleasure." Notwithstanding the extraordinary charms of Lais, she could never draw the philosopher Xenocrates to her house. Lais had such a passion for Eubates of Cyrene, that she made him promise to marry her, but after his having gained the prize at the Olympic games, he eluded that promise. Lais, at length, going to Thessaly

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ly to meet a young man, with whom she was passionately in love, the women of that country entertained such a jealousy against her, that they beat out her brains in the temple of Venus. However, all authors are not agreed that she died in this manner, for there are some who say, that she was choaked with an olive-stone. She died 340 years before the christian æra.

* LAIUS, in fabulous history, was the son of Addacus, king of Thebes, and married Jocasta, by whom he had Oedipus, who, according to the prediction of the oracle, killed him.

LAKE, a collection of waters contained in some cavity in an inland place, of a large extent, surrounded with land, and having no communication with the ocean.

Lakes may be divided into four kinds.

1. Such as neither receive nor send forth rivers. 2. Such as emit rivers, without receiving any. 3. Such as receive rivers, without emitting any. And, 4. Such as both receive and send forth rivers. Of the first kind, some are temporary, and others perennial: most of those that are temporary owe their origin to the rain, and the cavity or depression of the place in which they are lodged: thus in India there are several such lakes made by the industry of the natives, of which some are a mile, and some two in circuit; these are surrounded with a stone wall, and being filled in the rainy months, supply the inhabitants in dry seasons, who live at a great distance from springs or rivers. There are also several of this kind formed by the inundations of the Nile and the Niger; and in Muscovy, Finland, and Lapland, there are many lakes formed partly by the rains and partly by the melting of the ice and snow; but most of the perennial lakes, which neither receive nor emit rivers, probably owe their rise to springs at the bottom, by which they are constantly supplied. The second kind of lakes, which emit, without receiving rivers, is very numerous. Many rivers flow from these as out of cisterns; where their springs being situated low within a hollow place, first fill the cavity, and make it a lake, which not being capacious enough to hold all the water, it overflows and forms a river: of this kind is the Wolga, at the head of the river Wolga; the lake Odium, at the head of the Tanais; the Adac, from whence one branch of the river Tygris flows; the Ozero, or White Lake in Muscovy, is the source of the river Shackfna.

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The great lake Chaamay, which emits four very large rivers, which water the countries of Siam, Pegu, &c. viz. the Menau, the Afa, the Caipoumo, and the Laquia, &c. The third species of lakes, which receive rivers, but emit none, apparently owe their origin to those rivers, which in their progress from their source, falling into some extensive cavity, are collected together; and form a lake of such dimensions, as may lose as much by exhalation, as it continually receives from these sources: of this kind is that great lake improperly called the Caspian sea; the lake Asphaltites, also called the Dead sea; and several others. Of the fourth species, which both receive and emit rivers, we reckon three kinds, as the quantity they emit is greater, equal, or less than they receive. If it be greater, it is plain that they must be supplied by springs at the bottom; if less, the surplus of the water is probably spent in exhalations; and if it be equal, their springs just supply what is evaporated by the sun. Lakes are also divided into those of fresh water, and those of salt. Dr. Halley is of opinion, that all great perennial lakes are saline, either in a greater or less degree; and that this saltness encreases with time: and on this foundation he proposes a method for determining the age of the world. Large lakes answer the most valuable purposes in the northern regions, the warm vapours that arise from them moderating the pinching cold of those climates; and what is still a greater advantage, when they are placed in warmer climates at a great distance from the sea, the exhalations raised from them by the sun, cause the countries that border upon them to be refreshed with frequent showers, and consequently prevent their being barren deserts.

LAMA, the sovereign pontiff, or rather god of the Asiatic Tartars, inhabiting the country of Barantola. The lama is not only adored by the inhabitants of the country, but also by the kings of Tartary, who send him rich presents, and go in pilgrimage to pay him adoration, calling him *Lama-Cengiu*, i. e. God the everlasting father of heaven. He is never to be seen but in a secret place of his palace, amidst a great number of lamps, sitting cross-legged upon a cushion, and adorned all over with gold and precious stones; where, at a distance, they prostrate themselves before him, it not being lawful for any to kiss even his feet. He is called the great lama, or lama of lamas,

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Lamas, that is, priest of priests. And to persuade the people that he is immortal, the inferior priests, when he dies, substitute another in his stead, and so continue the cheat from generation to generation. These priests persuade the people, that the lama was raised from death many hundred years ago, that he has lived ever since, and will continue to live for ever.

LAMB, in zoology, the young of the sheep-kind. See *Sheep*.

* **LAMBRUN** (MARGARET) a Scotch woman, remarkable for her intrepidity. She was in the retinue of Mary queen of Scots, as was also her husband, who dying of grief for the tragical end of that princess, she resolved to revenge the death of both on queen Elizabeth. For this purpose she dressed herself in man's cloaths, assumed the name of Anthony Sparke, and repairing to the court of England, carried always about her a brace of pistols, one to kill Elizabeth, and the other herself. But one day as she was pushing through the crowd to come up to her majesty, who was walking in her garden, she happened to drop one of the pistols, which being seen by the guards, she was seized, in order to be sent to prison; but the queen, not suspecting her sex, had a mind first to examine her. Accordingly demanding her name, country, and quality; she replied with unshaken readiness, "Madam, tho' I appear in this dress, I am a woman. My name is Margaret Lambrun. I was several years in the service of queen Mary, whom you have so unjustly put to death, and by her death you have also caused that of my husband, who died of grief at seeing so innocent a queen perish so iniquitously. Now as I had the greatest love for them both, I resolved, at the peril of my life, to revenge their death, by killing you, who are the cause." The queen heard her with the utmost coolness, and calmly answered: "You are then persuaded that in this action you have done your duty, and satisfied the demands which your love for your mistress and your spouse indispensibly required from you; but what do you think it is my duty to do to you?" Margaret boldly replied, "I will tell your majesty frankly my opinion, provided you will please to let me know, whether you put this question as a queen, or as a judge." Her majesty saying, that it was as a queen. "Then," returned Margaret, "your majesty ought to grant me a par-

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don. "But what security can you give me," said the queen "that you will not make the like attempt upon some other occasion?" "Madam," replied Lambrun, "a favour given under such restraint, is no more a favour; and, in so doing, your majesty would act against me as a judge." Upon this the queen, turning to some who were present, cried, "I have been thirty years a queen, but do not remember to have had such a lecture ever read to me before: and then generously granted the pardon as unconditionally as it was desired. But Margaret also requested the queen to extend her generosity one degree farther, by granting her a safe-conduct out of the kingdom, till she landed on the coast of France, to which Elizabeth readily consented.

LAMENTATIONS, a canonical book of the Old Testament, written by the prophet Jeremiah. The two first chapters of this book are employed in describing the calamities of the siege of Jerusalem. In the third, the author deploras the persecutions he himself had suffered. The fourth turns upon the desolation of the city and temple, and the misfortune of Zedekiah. The fifth chapter is a prayer for the Jews in their dispersion and captivity; and at the end of all, he speaks of the cruelty of the Edomites, who had insulted Jerusalem in her misery. The four first chapters of the Lamentations are an abecedary, every verse or couplet beginning with one of the letters of the Hebrew alphabet, in the alphabetical order. The subject is of the most moving kind, and the stile throughout lively, pathetic, and affecting. "Did we ever find, says Dr. South, sorrow flowing forth in such a natural prevailing pathos, as in the Lamentations of Jeremy? One would think, that every letter was wrote with a tear; that every word was the noise of a breaking heart; that the author was a man compacted of sorrows, disciplined to grief from his infancy; one who never breathed but in sighs, nor spoke but in a groan."

LAMIE, in heathen mythology, a kind of dæmons, in the form of women, said to have devoured children.

LAMINÆ, in physiology, the thin plates whereof many substances consist.

* **LAMIA**, in fabulous history, the daughter of Neptune, was a beautiful African, and reported to be the first woman who had the gift of prophecy. She had several children by Jupiter, which so

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enraged Juno, that she destroyed them all; this rendered the mother so furious, that her countenance became terrible, and she ran about taking other people's children, and devouring them. There is another particular related of Lamia, or the Lamia: it is said, that they could take out their eyes and put them in again, when they pleased, that they kept them in a box when at home, and made use of them when they went abroad.

LAMIA, a famous Grecian courtesan, was the daughter of an Athenian, named Cleanor, and from being by profession a player on the flute, she became the concubine of Ptolemy I. king of Egypt. She was taken in the sea-fight in which Demetrius Poliorcetes gained the victory over Ptolemy, near the isle of Cyprus, and obtained the affection of Demetrius, though she began to be advanced in years. She excelled in witty sayings, and smart repartees. The Athenians, who carried their adulation, with regard to Demetrius, to the most extravagant impieties, built a temple to this courtesan, under the name of Venus Lamia.

LAMIUM, dead-nettle, in botany. The flowers of this plant are said to be good in the fluor albus, dysentery, and scrophulous disorders. The herb is aperient, emollient, and vulnerary.

LAMMAS-DAY, a festival celebrated on the first of August by the Romish church, in memory of St. Peter's imprisonment.

LAMP, a vessel containing oil, with a lighted wick.

LAMPERN, in ichthyology, a species of petromyzon. It grows to about a foot long, though most of those usually caught are under that standard.

LAMPREY, another species of petromyzon, with about twenty rows of teeth. It grows to two feet and an half, or more, in length. It is caught in some large rivers near the sea, but is much less frequent than the former species.

LANCASHIRE, a maritime county of England, bounded on the west by the Irish Sea; on the north by Cumberland and Westmoreland; on the east by the West Riding of Yorkshire; and on the south by Cheshire. It is sixty miles in length, but the breadth is very irregular. It is divided into six hundreds, and has twenty-seven market-towns, and sixty parishes. As it is a county palatine, it has a court, in the duchy-chamber of Lancaster at Westminster, which takes cognizance of all causes that concern the

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revenue belonging to the duchy, of which the chief judge is the chancellor, under whom there is an attorney-general, a receiver-general, an auditor, the king's serjeant and council, secretary, deputy-clerk, and register, attorney's-usher, deputy-usher, and messenger. There is likewise a court of chancery held at Preston, to determine all causes in an equitable manner, relating to some peculiar customs of this duchy. The chancellor is also chief judge of this court, and has several officers under him. The people are represented in parliament by fourteen members, two for the county, and two each for the following towns, namely, Lancaster, Liverpool, Preston, Wigan, Clitheroe, and Newton. This county made part of the territory of the Brigantes, in the time of the Romans; and when the Saxons governed it, was subject to the kings of Northumberland, though the dominion was sometimes divided into two. In the reigns of the Norman monarchs it was dignified with the honours and privileges of a county-palatine and duchy, which it still enjoys. The air of this county is pretty good, and not so subject to fogs as some others that are next the sea, but the fens are unwholesome. The soil in some parts yields plenty of corn, but the hilly parts to the eastward are generally stony and barren. Those places called the mosses yield very good turf for fuel. This county likewise produces very good hemp, and the cattle here are of a very large size. They have mines of coal, quarries of stone, and plenty of wood, and the sea-port towns, particularly Liverpool, carry on a very considerable foreign trade. The principal rivers here are the Mersey, which divides this county from Cheshire on the south; the Ribble, the Were, and the Lon. Besides these rivers there are several meers or large ponds, as Winander and Keninston; that of Winander is the largest, being ten miles in length, and two in breadth; it abounds with all sorts of fish, but is most remarkable for the char, which is accounted a great rarity, and is sent potted to London and various parts of the kingdom; this fish has been thought peculiar to Winander meer, but that is a mistake, for it is found in Keninston meer, in a lake in Wales, and in the lake of Geneva. Keninston meer is neither so large nor full of fish, and Martin meer has been drained many years ago. There are many mineral springs, of different sorts and kinds, said to be good for many

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many diseases. The most remarkable of these is the burning well at Ancliff, two miles from Wigax. Besides the river fish on the sea-shore they have the sea-dog, ink-fish, and the sheath-fish, upon the sands near Liverpool; besides greenbacks, mullets, soals, sand-eels, oysters, lobsters, shrimps, and prawns; as also the best and largest cockles in England. On the sea-shore they have many unusual birds, as the sea-crow, blue on the body, and black on the head and wings; the puffin; the asper, a kind of sea-eagle; the spurling-fisher, the cormorant, the curlew-bill, and the razor-bill.

* **LANCASTER**, the county town of Lancashire; it was anciently a Roman station, and was destroyed and burnt by the Scotch, after a sudden irruption in 1322. It was afterwards rebuilt near a green hill. It was incorporated by king John, and is governed by a mayor, recorder, seven aldermen, two bailiffs, twelve capital burgesses, twelve common burgesses, a town clerk, and two serjeants at mace. The members of parliament are elected by a majority of the freemen, and it has two weekly markets, on Wednesdays and Saturdays, and three fairs, on May 1, for cattle, cheese, and pedlar's ware; on July 5, for cattle, cheese, pedlar's ware, and wool; and on October 10, for cattle, wool, cheese, and pedlar's ware. The assizes are held in the castle, where is also the county jail. This is a very ancient structure, and not very long since, in digging a cellar, under it were found Roman utensils and vessels for sacrifice, as also coins of the Roman emperors, so that it was probably a Roman fortress. On the top of the castle there is a square tower, called John of Gaunt's chair, from whence there is a charming prospect of the adjacent country, especially towards the sea, where the Isle of Man may be descried. This town has but one church, which is large. On the side of the hill below it, hangs a piece of a Roman wall, called Wery wall. The harbour is so choaked with sand, that it will not admit ships of any considerable burthen. It is sixty-eight miles south-south-east of Carlisle, and two hundred and thirty-three north-north-west of London.

LANCEOLATED LEAF, one resembling a spear's point.

LANCET, a surgical instrument, sharp pointed and two edged, chiefly used for opening veins in the operation of phlebotomy, or bleeding; also for laying open abscesses, tumors, &c.

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LAND, in a limited sense, denotes arable ground. It is also used for meadow-ground, pasture, wood, commons, &c.

Various are the methods of improving lands, as, 1. By inclosing and dividing the same into several fields, for pasture or tillage, which is one of the most principal ways of improvement, first, by ascertaining to every man his just property, and thereby preventing a number of trespasses and injuries, that lands in general are subjected to, besides the disadvantage of being obliged to keep the same seasons with the other people who have land in the same field; so that the sowing, fallowing, and tilling the ground, must be equally performed by all the land-holders; and, when there happens a slothful negligent person, who has land intermixed with others, it is one of the greatest nuisances imaginable. Secondly, it being of itself a very great improvement; for, where land is properly inclosed, and the hedge-rows planted with timber-trees, &c. it preserves the land warm, and defends and shelters it from the violent cold nipping winds, which in severe winters destroy much of the corn, pulse, or whatever grows on the open field, or champaign grounds. And where it is laid down for pasture, it yields much more grass than the open fields, and the grass will begin to grow much sooner in the spring. The hedges and trees also afford shelter for the cattle from the cold winds in winter; as also shade for them in the great heats of summer. And these hedges afford the farmer plenty of fuel, as also plough-boot, cart-boot, &c. and, where they are carefully planted and preserved, furnish him with timber, and mast for his swine: or, where the hedge-rows are planted with fruit-trees, there will be a supply of fruit for cyder, perry, &c. which, in most parts of England, are of no small advantage to the husbandman.

By this method of inclosing, there is also much more employment for the poor, and is therefore a good remedy against beggary; for in those open countries, where there are great downs, commons, heaths, and wastes, there is nothing but poverty and idleness to be seen amongst the generality of their inhabitants. It is very observable of late years, how much advantage the inclosing of the land in Worcestershire, and some other counties at a distance from London, has been to the inhabitants; for, before this method was introduced amongst them,

the lands, for the most part, lay in commons, &c. upon which the poorer sort of people built themselves cottages with mud walls, where they contented themselves with a cow or two, and some swine: and those of them who were more industrious than the rest, travelled to the neighbourhood of London every spring, where they were employed in the gardens and fields for the summer season; and in autumn they returned to their native counties, where they lived in winter upon what money they had saved in summer. But, since they have converted their wastes and commons into inclosures, there are but few of the inhabitants of those counties who come to London for work, in comparison to the numbers that formerly came; so that most of the labourers who come to London for employment, are either Welch, or inhabitants of some distant counties, where this improvement hath not as yet been introduced.

The advantages of inclosing land are now so generally known, that there is no occasion for us to enumerate them here; since the improvements which have been made of late years, in several parts of England, and the increase of rent, that is every-where made by those that inclose, are sufficient arguments to enforce the practice, and render it general; more especially in the North, where it is much neglected; because it would greatly shelter the lands, and render them much warmer than they now are.

In inclosing of land, there should be regard had to the nature of the soil, and what it is intended for; because corn land should not be divided into small parcels; for, besides the loss of ground in hedges, &c. the corn seldom thrives so well in small inclosures, as in more open fields; especially where the trees are large in the hedge-rows. The grass also in pastures is not so sweet near hedges, or under the drip of trees, as in open exposures; so that where the inclosures are made too small, or the land is overplanted with trees, the herbage will not be near so good, nor in so great plenty, as in larger fields: therefore before a person begins to inclose, he should well consider how he may do it to the greatest advantage: as, for instance, it is always necessary to have some smaller inclosures near the habitation, for the shelter of cattle, and the conveniency of shifting them from one field to another, as the season of the year may require; and hereby the habitation, barns, stables, and

outhouses, will be better defended from strong winds, which often do great damage to those that are exposed to their fury. These small inclosures may be of several dimensions; some of them three, four, six, or eight acres in extent; but the larger divisions for corn should not contain less than twenty or thirty acres, or more, according to the size of the farm.

The usual method of inclosing land is, with a ditch and bank set with quick. But in marsh land, where there is plenty of water, they content themselves with only a ditch, by the sides of which they usually plant fallows or poplars, which, being quick of growth, in a few years, afford shade to the cattle; and when they are lopped, produce a considerable profit to their owners. See *Fence*.

2. The draining of land is also another great improvement to it: for though pastures and meadows, which are capable of being overflowed, produce a greater quantity of herbage than dry land; yet where the wet lies too long upon the ground, the grass will be sour, and extremely coarse; and where there is not care taken in time to drain this land, it will produce little grass, and soon be over-run with rushes and flags, so as to be of small value. See *Bog and Fen*.

As the draining of cold wet lands is a great improvement to them, so the floating or watering of dry loose lands is not a less advantage to them. This may be easily effected where there are rivers, or reservoirs of water, which are situated above the level of the ground designed to be floated, by under-ground drains, through which the water may be conveyed at proper seasons, and let out on the ground: in order to this, there must be good sluices made at the heads of the drains, so that the water may never get out, but at such times as is required, for if this be not taken care of, the water, instead of improving the land, will greatly damage it.

But where the land lies so high, as that there is no water in the neighbourhood lying above its level, it will be more expensive, because in such case the water must be raised by machines, from reservoirs or streams which lie below it. The most common engine for this purpose is the Persian wheel. See the article *Persian Wheel*.

Yet notwithstanding the expence of raising the water, it has been found very advantageous, in many parts of England,

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to drown the lands, for the profit has many times more than doubled the charge.

The time for drowning of land is usually from November to the end of April: but though this is the general practice, yet for many reasons it is not to be approved of: the first is, that by the water lying continually on the ground in the winter, the roots of the finer sorts of grafs are rotted and destroyed; and by letting on of the water at the season when the seeds of docks, and other bad weeds, which commonly grow by river-sides, are falling, these seeds are carried upon the land, where they remain and grow, and fill the ground with bad weeds; which is commonly the case with most of the water meadows in England, the grafs in general being destroyed; so that rushes, docks, and other trumpery, make up the burden of these lands; but if these meadows were judiciously managed, and never floated till March or April, the quantity of sweet good grafs would be thereby greatly increased, and the beautiful verdure of the meadows preserved: but there is little hope of convincing those persons by arguments, who are so much wedded to their own prejudices, as to shut their eyes and ears against experiments or reason. Where the land is very hot and dry, and it lieth convenient to be watered at a small expence, it should be repeated every week in dry hot weather, which will prove a great advantage to the land. But whenever this is done, there should no cattle be admitted while it is wet; for they will poach, and spoil the turf.

3. Another great improvement of land is by burning of it; which, for sour, heathy, and rusty land, be it either hot or cold, wet or dry, is a very great improvement: so that such lands will, in two or three years after burning, yield more, exclusive of the charges, than the inheritance was worth before; but this is not to be practised on rich fertile land; for as the fire destroys the acid juice, which occasions sterility in the poor land, so it will in like manner consume the good juices of the richer land, and thereby impoverish it; so that it hath been with great reason diffused in deep rich countries.

4. It is also a very great improvement, where land is overgrown with broom, furze, &c. to stub them up by the roots, and when they are dry, lay them on heaps, and cover them with the parings

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of the earth, and burn them, and spread the ashes over the ground. By this method vast tracts of land, which at present produce little or nothing to their owners, might be made good at a small expence, so as to become good estates to the proprietors.

* **LANDAFF**, a city in Glamorgan-shire, so called from being a bishop's see, tho' at present it is little more than a village. It is seated on the river Taff, but its cathedral stands on the low ground, being a spacious and superb structure. It has two fairs, on February 9, and Whit-Monday, for cattle and stockings: not far from the cathedral are the ruins of an old castle, which was formerly the bishop's palace. It is forty miles north of Bristol, and one hundred and and sixty-seven west of London. Long. 3. 20. E. Lat. 51. 33. N.

* **LANDSDOWN HILL**, *Battle of*, (July 5. 1643.) The two houses, immediately after the battle of Stratton, sent Sir William Waller to raise an army in the county of Somerset, in order to retrieve their affairs. He acted with such secrecy and dispatch, that a detachment from his army endeavoured to beat up the quarters of the marquis of Hartford at Somerton, before he had any intelligence of their approach. They were, however, repulsed by the earl of Carnarvon, who pursued them so far, that he fell into a kind of ambuscade formed by a strong party of Waller's dragoons, before which he was obliged to retreat in his turn, till he was sustained by prince Maurice: a very smart action ensued, in which the prince exhibited repeated proofs of the most intrepid bravery, and the enemy were routed with considerable loss. The royalists having rested a few days at Wells, advanced towards Sir William Waller, who had fixed his head-quarters at Bath, and received from London a reinforcement of five hundred cavalry, so completely armed with cuirasses and defensive armour, that the loyalists termed them the lobsters; and in the sequel found them generally irresistible. After some skirmishes that were fought with various success, the marquis and prince Maurice marched to Marsfield, five miles beyond Bath, in the road to Oxford. Waller, whose aim was to prevent their joining the king, immediately took possession of Landsdown hill, which he fortified with breast-works and cannon. Then he detached a body of horse towards Marsfield, from whence they were driven back by the

the loyalists, who drew up their forces in order of battle on the plain; but perceiving how advantageously the enemy was posted, they began to retreat to their old quarters. Waller immediately sent his whole cavalry to fall upon their flank and rear; and the new regiment of cuirassiers did great execution, so that the king's horse, hitherto deemed invincible, were broken and dismayed: nevertheless they were rallied by the valour and activity of their officers, and the enemy fled in their turn. Then the royalists attacked the hill with surprizing courage, and gained the summit after a very obstinate engagement, the enemy retiring behind a stone wall, where they faced the king's troops in good order till night, and then retired to Bath by favour of the darkness. The marquis was left in possession of the field; but the victory was not purchased without considerable damage. Sir Bevil Greenhill was killed in the attack, together with a good number of excellent officers; and next morning, as Sir Ralph Hopton and serjeant-major Sheldon rode about the field, they were blown up with gun-powder, eight barrels of which happened to be in a waggon, and took fire either by treachery or accident. The major died next day, to the unspeakable regret of the army, by which he was beloved for his courage and amiable disposition; and Sir Ralph Hopton was so miserably scorched, that they despaired of his recovery. The loss of this great man, who was the darling of the soldiers, they deemed equivalent to a defeat, and retreated with heavy hearts to Marsfield.

LANDSKIP, or LANDSCAPE, in painting, the view or prospect of a country, extended as far as the eye will reach.

LANGUAGE, an assemblage of expressions among any people, whereby to communicate their thoughts to each other. And this chance or caprice has established at first; so that usage is the rule of a language, nor has reason any thing to do therein, unless to study or teach it, such as it is. Here then commences grammar, which only furnishes reflections, called rules, to which the manners of speaking used in that language may be reduced.

There is found a constant resemblance between the genius of each people, and the language they speak. Thus the Greeks, a polite but voluptuous people, had a language perfectly suitable, full of delicacy and sweetness. The Romans, who seemed only born to command, had

a language noble, nervous, and august; and their descendants, the Italians, are sunk into softness and effeminacy, which is as easily perceivable in their language as in their manners. The language of the Spaniards is full of that haughtiness which constitutes the distinguishing character of the people. The French, who have a world of vivacity, have a language that runs extremely brisk and lively. And the English, who are naturally blunt, thoughtful, and of few words, have a language exceeding short, concise, and sententious.

The diversity of languages is generally allowed to have taken its rise from the confusion at the Tower of Babel; both by Jews, Christians, and Mahometans; but the manner in which this diversity was effected is still in dispute among the learned.

As to the point of antiquity and priority among languages, that too has been extremely controverted. The Egyptians and Phrygians disputed concerning the antiquity of their languages; the Arabs dispute the point of antiquity with the Jews; but these, jealous even to excess of the honour of their nation, positively insist that the Hebrew tongue, such as is found in the Holy Scriptures, is the primitive language, and that spoken by the first man; while others contend that the Hebrew, Chaldee, and Arabic, are only dialects of the original tongue: however that be, the Arabic is held to be the most copious of all languages. See the articles *Arabic, Chaldee, Hebrew, Egyptian, and Phrygian*, &c.

Languages are divided into, 1. Original or mother tongues, as the Hebrew and Arabic in the East; Kircher adds the Coptic; the Teutonic and Slavonic in the West. And Du John maintains the Gothic to be the mother of the Teutonic tongues, namely, those spoken in the North; and some add the Biscayan or Bas Briton, as the mother-tongue of the Celtic or Gauls.

2. Derivative languages, which are those formed out of a mixture of several others, as Latin, French, &c.

Learned or dead languages are those which only subsist in books, and which must be learned by the rules of grammar, as the Greek, Hebrew, Syriac, and Chaldee.

Living languages are those still spoken in some country or other, and which may be learned by conversation. The most popular among these are the French, Italian, Spanish, and English.

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LANGUED, in heraldry, is applied to such animals whose tongues appear out of their mouths, being of a different colour from that of the body.

LANGUEDOC, a province in the south of France, bounded on the north by Querci, Rouergue, Auvergne, and Lyonnais; on the east by Dauphiny and Provence; on the west by Gascony, and on the south by the Mediterranean sea and Roussillon. It is two hundred and twenty-five miles in length, and one hundred in breadth, where broadest. It is a very fertile country, abounding in corn, fruit, and the most exquisite wines. The most considerable rivers are the Rhone, the Garonne, the Aude, the Tarn, the Allier, and the Loire. This province is divided into two by the Royal Canal, which joins the Mediterranean and the ocean, which was undertaken in 1666, and finished in 1680. There are a great number of mineral springs in this province, and there are mines of iron, lead, silver, and gold; but these last are inconsiderable, and not worked. The quarries of marble are near the town of Cosne, and are very advantageous to the province in general. It has a red ground with white spots, and is known by the name of marble of Languedoc. The clergy of this province are the richest and most numerous of all France. The capital city is Toulouse.

LANGUOR, a faintness or relaxation of the members, owing either to a want or decay of spirits.

LANIGEROUS, among herbalists, trees that bear such a woolly or downy substance as is commonly contained in the catkins of the willow, &c.

LANIUS, the butcher-bird, in ornithology, a species of falcon, with black legs, a grey back, and variegated belly.

LANNAR, or **LANERET**, the blue-legged falcon, with oblong black and white spots. It is a very beautiful bird, about the size of a common crow, very bold, and usually kept for the diversion of hawking.

LANTERN, or **LANTHORN**, a well-known invention for shewing light in the night.

Magic **LANTERN**, an optic machine, whereby little painted images are represented so much magnified, as to be accounted the effect of magic by the ignorant.

The contrivance is briefly this: A B C D (pl. XXV. fig. 3.) is a lanthorn, from whose side there proceeds a square tube *b n k l m c*, consisting of two parts;

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the outermost of which *n k l m* slides over the other, so as that the whole tube may be lengthened or shortened by that means. In the end of the arm *n k l m* is fixed a convex glass *k l*; about *d e*, there is a contrivance for admitting and placing an object, *d e*, painted in dilute and transparent colours, on a plane thin glass, which object is there to be placed inverted. *b b c* is a deep convex glass, placed in the other end of the tube, the only use of which is to cast the light of the flame strongly on the picture *d e*, painted on the plane thin glass. Hence, if the object *d e* be placed farther from the glass *k l* than its focus, it is manifest that the distinct image of the object will be projected by the glass *k l* on the opposite white wall F H. at *f g*; and that in an erect posture. See *Camera obscura*.

LANTERN, in architecture, a little dome raised over the roof of a building, to give light, and serve as a crowning to the fabric.

LANUGO, the soft down of plants, like that growing on the fruit of the peach-tree; whence such plants are termed lanuginous.

LAPATHUM, the dock, in botany, a perennial plant.

LAPATHUM acutum folio plano, sharp-pointed wild dock. The roots of the sharp-pointed dock, as well as the other common wild docks, are supposed to have an aperient and laxative, as well as an astringent and corroborating virtue, approaching in this respect to rhubarb, but differing widely in degree, their stypticity being greater, and their purgative quality, if really they have any purgative quality at all, far less. They stand recommended in habitual costiveness, obstructions of the viscera, scorbutic and cutaneous maladies: in which last intention, fomentations, cataplasms, or unguents of the roots have been commonly joined to their internal use: in many cases, the external application alone is said to be sufficient. A decoction of half an ounce or an ounce of the fresh roots, or of a dram or two of the dry roots, is commonly directed for a dose.

LAPATHUM aquaticum folio cubitali, great wild water dock.

LAPATHUM rhubarbarum monachorum, Monks rhubarb, garden patience.

This root is supposed to possess the virtues of rhubarb, in an inferior degree. It is obviously more astringent than rhubarb, but comes very far short of it in purgative virtue, though given, as usually directed, in double its dose; manifesting the

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the stomach, without producing any considerable evacuation. It communicates a deep yellow tincture both to water and spirit.

LAPIDARY, an artificer who cuts precious stones.

The art of cutting precious stones is of great antiquity. The French, though they fell into it but lately, have notwithstanding carried this art to a very great perfection, but not in any degree superior to the English.

LAPIS, in general, is used to denote a stone of any kind.

LAPSA denotes a patron's neglect or omission to present to a church within six months after it becomes vacant. When after a vacancy the patron does not present in six months, the ordinary has the next six months to collate to the benefice; and if he does not present within that time, the metropolitan has farther six months to do it in; and if he should fail in doing it in his time, the next six months devolves to the crown.

LARCENY, in law, a felonious carrying away another person's goods; and this, according to the value of the thing stolen, is either grand, or petit larceny; the first being stealing effects above the value of 1 s. and the last such as are either of that value, or under it; but where two persons together steal goods to the value of only 13d. it is grand larceny in both; and if one person at different times steal several different things from the same person, which amount upon the whole to above 12 d. value, they may be joined in one indictment, and the offender found guilty of grand larceny; but this is very seldom practised; on the contrary, the jury, where the theft appears to be the first offence, frequently bring in their verdict, as they lawfully may, that the things are not above 10 d. value, and by that means reduce the offence to petit larceny, though the offender may perhaps be indicted for stealing to the value of 30 or 40 s. and upwards. The crime of grand larceny is punishable with death, and that of petit larceny only with the corporal punishment of whipping, &c.

LARES, certain inferior deities among the ancient Romans, who were the guardians of houses; they were also sometimes taken for the guardians of streets and ways, and Tibullus makes them the guardians of the fields.

LARIX, the larch tree, in botany, a genus of trees, whose leaves, which are

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long and narrow, are produced out of little tubercles, in form of a painter's pencil: the cones are produced at remote distances from the male flowers on the same tree: the male flowers are very like small cones at their first appearance, but afterwards stretched out in length. These trees are propagated by seeds, which should be sown in the beginning of March, upon a bed of light soil, exposed only to the morning sun: or otherwise it may be sown in pots or boxes of light earth, and placed near an hedge, where they may have the morning sun only. These trees are very proper for the sides of barren hills, where few other sorts will thrive so well; nor is this tree very delicate in its soil, but will grow much better on poor strong stony land, than in rich ground: and, during the summer, they appear very beautiful; but in autumn they cast their leaves, whereby some people have been deceived, by supposing them dead, and have destroyed them. From the wounded bark of this tree exudes the purest Venice turpentine; and on the body and branches of it grows the agaric, which is a drug used in medicine: the wood is very durable, and, by some, reported to be very difficult to burn. But I do not know how this should be, to a tree which abounds with turpentine; though it is said also to be so ponderous as to sink in water. It will polish exceeding well, and is by the architects abroad much coveted, both for houses, and building of ships. Witsen, a Dutch writer upon naval architecture, mentions a ship to be long since found in the Numidian sea, twelve fathoms under water, being chiefly built of this timber and cypress, both which woods were reduced to that hardness, as to resist the sharpest tools; nor was any part of it perished, though it had lain above a thousand years submerged. And it was upon tables of this wood that Raphael, and several of the greatest artists, eternised their skill, before the use of canvas was introduced. *Miller's Gard. Dict.*

LARK, *Alouda*, in ornithology, a distinct genus of birds. To this genus belong, 1. The sky-lark, with the long-winged feathers, variegated with white and brown. 2. The tit-lark, with a white line over the eyes. 3. The wood-lark, with the wings obliquely variegated with white. 4. The yellow-breasted lark. 5. The snow-bird, or pied chaffinch, with the tail feathers black, except the three lateral ones, which are white.

LARK-SPUR, *delphinium*, in botany. See *Delphinium*.

LAR-



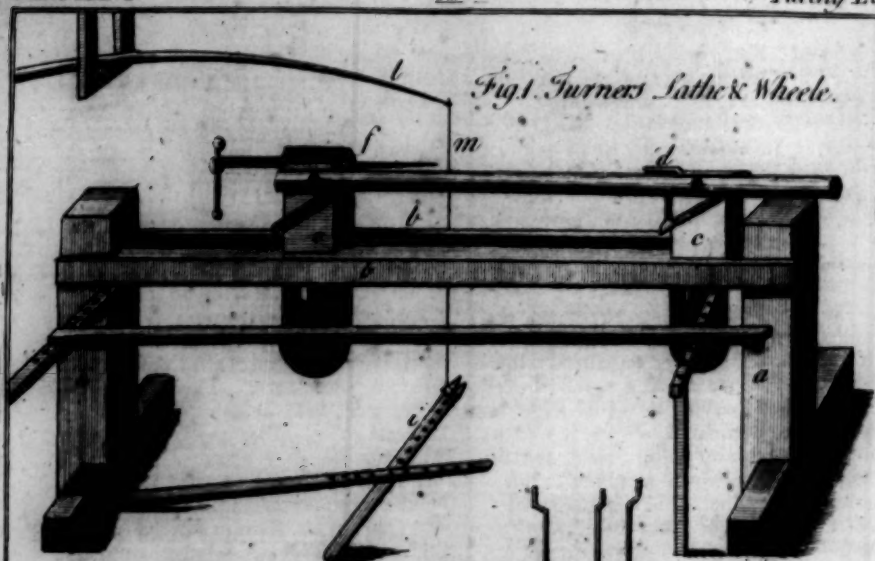


Fig. 1. Turners Lathe & Wheel.



Fig. 2. Lathe.



Fig. 3. Braziers Lathe.

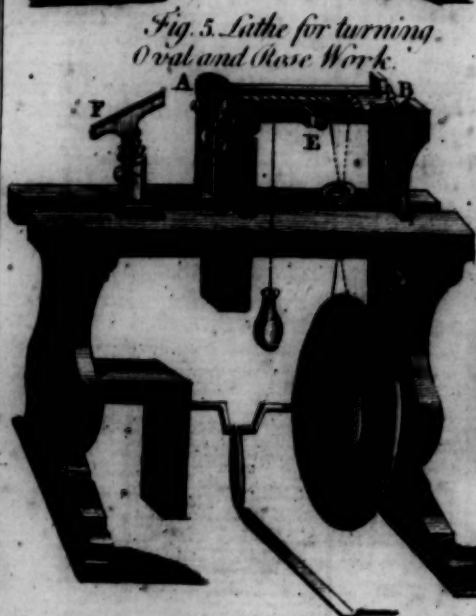


Fig. 5. Lathe for turning Oval and Rose Work.

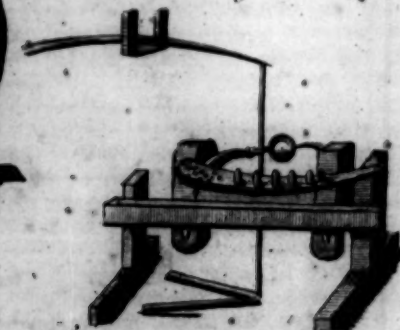


Fig. 4. An Iron Lathe for turning small Work in Metal.

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LARMIER, in architecture, a flat square massive member of the cornice, between the cymatium and ovolo.

LARUS, the gull, in ornithology, a genus of the anseres order of birds.

LARYNX, in anatomy, forms the protuberance in the upper and anterior part of the neck, called pomum Adami: it is termed the head of the trachea arteria, being more prominent in men than in women. It principally consists of five cartilages, as the cartilago thyroïdes, cricoides, two arytenoides, and the epiglottis; they are connected together by ligaments, and have muscles, glands, and membranes belonging to them. The larynx serves particularly to admit and let out the matter of respiration; and the solidity of its pieces hinders not only external objects, but also any hard thing, which we swallow, from disordering this passage. The glottis, being a narrow slit, modifies the air we breathe, and as it is very easily dilated and contracted, it forms the different tones of the voice, by means of the different muscles inserted in the cartilagines arytenoides, to which the other muscles, both proper and common, are assistants. The whole larynx is also of use in deglutition, by means of its connection with the os hyoides, to which the digastric muscles of the lower jaw adhere, which muscles raise the larynx with the os hyoides every time we swallow. The faculty of varying and changing the tone of the voice depends on the flexibility of the cartilages of the larynx, and decreases in proportion as we advance in age.

LASERPITIUM, Lafer-wort, a genus of plants.

LASSITUDE, *Lassitudo*, in phisic, a morbid sensation that comes on spontaneously without any previous motion, exercise, or labour. This is a frequent symptom in acute distempers. It arises either from an increase of bulk, a diminution of proper evacuation, or too great a consumption of the fluid necessary to maintain the spring of the solids, or from a vitiated secretion of that juice. The remedy in the first is evacuation, and in the other a proper diet, or such alterative medicines as influence such a secretion.

LAST, in general, signifies the burden or load of a ship. It signifies also a certain measure of fish, corn, wool, leather, &c. A last of cod-fish, white herrings, meal, and ashes for soap, is twelve barrels: of corn or rape-feed, ten quarters; of gun-powder, twenty-four bar-

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rels; of red herrings, twenty cades; of hides, twelve dozen; of leather, twenty dickers; of pitch and tar, fourteen barrels; of wood, twelve sacks; of stock-fish, one thousand; and of flax or feathers, one thousand and seven hundred pounds weight.

LAST, in the marshes of Kent, is applied to a court held by the twenty-four jurats, in which orders are given for the imposing and levying of taxes for preserving the said marshes.

LATERAN COUNCILS, those councils held in the Basilica of the Latin church at Rome. See *Council*. There have been five councils held in this place, viz. in the years 1123, 1139, 1179, 1215, and 1513.

A LATERE, a term used to denote the qualifications of cardinals whom the pope sends as legates into foreign courts, who are called legates a latere, as being assistants to his holiness, and counsellors in ordinary: these are the most considerable of the three other legates, being such as the pope commissions to take his place in councils, and so called in regard that he never gives this office to any but his favourites and confidants, who are always *a latere*, at his side.

DE LATERE, legates who are not cardinals, but yet are intrusted with an apostolical legation.

LATH, in building, a long, thin, and narrow slip of wood, used to nail to the rafters of a room or ceiling, in order to sustain the covering. These are distinguished into three kinds, according to the different kinds of wood of which they are made, viz. heart of oak, sap laths, and deal laths; of which the two last are used for ciellings and partitions, and the first for tiling only.

LATH-BRICKS, bricks much longer than ordinary, used instead of laths, for drying malt: for which purpose they are extremely proper, as not being liable to catch fire, and retaining the heat much longer than those of wood; so that a very small fire will serve, after they are once heated.

LATHE, an engine used in turning wood, ivory, and other materials. (See plate XXVI. fig. 1.) It is composed of two legs or styles, *a a*, which are commonly about two feet ten inches high, on the upper part of which are fastened two pieces of wood, called cheeks, *b b*, parallel to the horizon: between these are two pieces of wood, called puppets, *c c*, made to slide between the cheeks, and to

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be fixed down at any point at pleasure; near the upper end of one of these puppets is fastened a strong spike of tempered steel, *d*, and opposite to it, in the other, is an iron screw, *f*; by these the piece to be turned is sustained, and is turned round by means of the string *m*, put round it, and fastened above to the pliable pole *l*, and underneath to the treddle or board, *i*, moved with the foot: there is also a piece of wood between the cheeks, called a rest, *e*, whose office is to rest the tool upon, that it may lie in a steady position while the workman uses it.

When turners perform heavy work, which the pole and treddle will not command, they use instead of these a wheel (fig. 2.) which is turned about sometimes with one, and sometimes with two handles, according to the weight of the work; its string hath both its ends neatly fastened together, and this being fixed in a groove round the edge of the wheel, and after being crossed, put round a groove in the work, it is easily turned round with a swift and regular motion. This is the most expeditious method of working; for the springing up of the pole makes an intermission in the turning of the work, but with the wheel it always turns the same way, so that the tool need never be taken off, unless it be to examine the work as it is doing.

Braziers, who turn pots, kettles, &c. have their lathe made in a different manner from that used by turners, as may be seen in fig. 3.

The puppets and rests are much stronger than those used by the turners: their edge-tools, which they call hooks, are also of a different shape from the chisels and other tools used by turners, as may be seen *ibid.* marked B 1, B 2, B 3, being bent backwards and forwards at the cutting end. And as the common turners work with a round string made of gut, the braziers work with a flat leather-thong, which wrapping close and tight about the rowler of their mandril, commands it with the greater ease, and turns it more forcibly about.

Small work in metal is turned in an iron lathe, called a turn-bench, represented in fig. 4. When this is used, it is fixed in the chaps of a vice, and the work being fitted on a small iron axis, with a drill barrel fitted upon a square shank near the end of it, the workman turns it round with a drill-bow, which he holds in his left hand, while he forms

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the moulding with a graver or other tool, which he holds in his right.

In turning oval or rose-work, the common turner's lathe must be provided with the additional parts represented in fig. 5. which represents the whole machine with all its parts ready for working; A being the fore-puppet, with its apparatus; B, the hinder-puppet; C, a hollow axis, turned into a screw fashion, to direct the weight D, by means of the nut E; and F, the support of the tools, which may be raised or lowered at pleasure.

LATHE, or LETH, as used in Kent and Sussex, is part of a county, containing three or four hundreds.

LATHRÆA, great tooth-wort, in botany, a genus of plants.

LATHYRUS, chickling pea, in botany, a genus of plants.

* LATIMER, (HUGH) bishop of Winchester, one of the first reformers of the church of England, was born at Thirkeson, in Leicestershire, about the year 1470, and studied at Cambridge. Having entered into priest's orders, he behaved with remarkable warmth and zeal in defence of popery: heard with the highest indignation those who were turned the novel teachers, and inveighed publicly and privately against the reformers. In short, his zeal was so remarkable, that the university elected him their cross-bearer in all public processions; a post which he discharged with the utmost solemnity. Among the favourers of the Reformation was Mr. Thomas Bilney, a clergyman, distinguished by his exemplary piety and humanity; and this gentleman being acquainted with Mr. Latimer, whom he esteemed on account of his sincerity and honesty of heart, he, as opportunities offered, suggested many things to him about corruptions in religion in general, and exhorted him to lay aside his prejudices, and consider with an honest heart the objections urged against the doctrines of popery. This had its desired effect, and Mr. Latimer no sooner ceased being a zealous papist, than, from the same warmth of constitution, he became a zealous protestant, and was extremely assiduous in making converts, both in the town and university. The first remarkable opposition he met with was occasioned by a course of sermons he preached before the university, during the Christmas holidays, in which he particularly insisted on the great abuse of locking up the scriptures in an unknown tongue, and shewed that true religion

was seated in the heart; and that, in comparison with it, external appointments were of no value. The discourses occasioned a great outcry. Mr. Latimer was a preacher of some eminence, and began to display remarkable address in adapting his discourses to the capacities of the people. The clergy now thought it high time to oppose him openly; and Dr. Buckingham, prior of the Black Friars, appearing in the pulpit a few Sundays after, with great pomp and proximity attempted to shew the dangerous tendency of Mr. Latimer's opinions, particularly of the heretical notion of having the scriptures in English. Mr. Latimer listened with a secret pleasure, and afterwards could not resist his inclination to expose this solemn trifler. The whole university met together on Sunday, when it was known Mr. Latimer would preach, and just before the sermon began, prior Buckingham entered the church, and with an air of importance seated himself before the pulpit. Mr. Latimer, with great gravity, recapitulated the learned doctor's arguments, placed them in the strongest light, and rallied them with such a flow of wit and good humour, that without the least appearance of ill-nature he made his adversary in the highest degree ridiculous. He then, with great address, appealed to the people on the low esteem in which their holy guides had always held their understandings; expressed the utmost offence at their being treated with such contempt, and wished his honest countrymen might only have the use of the scriptures till they shewed themselves such sad interpreters. He concluded his discourse on a few observations on scripture metaphors; and, in short, his sermon had such an effect, that the prior was for the future contented to shut himself up in his monastery. The credit of the protestant party thus increased at Cambridge, while Bilney and Latimer were at their head. The popish clergy and the heads of colleges were alarmed: frequent convocations were held, and the tutors were admonished to have a strict eye over their pupils; but Mr. Latimer continued to preach, and hereby to spread. The heads of the popish party applied to the bishop of Ely, who came to Cambridge, and was contented with silencing Mr. Latimer. But there happened to be then a protestant prior at Cambridge; this was Dr. Barnes, of the Austin Friars, which being exempt from the episcopal jurisdiction, he boldly

licensed Mr. Latimer to preach there. Thither this party followed him; and the late opposition having greatly excited the curiosity of the people, the friars chapel was soon incapable of containing the crowds that attended. Among others the bishop of Ely was frequently one of his hearers, and had the ingenuity to declare, that Mr. Latimer was one of the best preachers he had ever heard. The credit to his cause, which our preacher had thus gained in the pulpit, he maintained out of it by a holy life. Mr. Bilney and he, not satisfied with acting unexceptionably, were daily giving instances of goodness, which malice could not scandalize, nor envy misinterpret. Their adversaries, impotent themselves, and finding their diocesan unwilling to execute their purposes, now carried their complaints to Henry VIII. who expecting to have his divorce ended in a regular way at Rome, took care to observe all the forms of civility with the pope. Immediately a court was erected by cardinal Wolsey, and Tunstall being made president, Bilney, Latimer, and one or two more, were called before him. Bilney was prevailed upon to recant, and as Tunstall omitted no opportunities of shewing mercy, Bilney bore his faggot and was dismissed: The rest escaped on easier terms; and all of them returning to Cambridge, were received with open arms by their friends. Bilney, however, filled with remorse, grew melancholy, and three years after, resolving to expiate his abjuration, went to Norfolk, and preaching publicly against popery, was executed at Norwich. Bilney's sufferings seemed to inspire the leaders of the Reformation at Cambridge with new courage, and Mr. Latimer wrote a letter to the king against a proclamation which had been just published, forbidding the use of the Bible in English, and other books on religious subjects, which the king received with temper; and soon after Dr. Butts, the king's physician, being sent to Cambridge to promote the establishment of the king's supremacy, the zeal Mr. Latimer shewed on this occasion, rivetted him in the royal favour, and he obtained a benefice in Wiltshire, to which he retired, and not only entered on the duty of his parish, but extended his labours throughout the country. But the clergy being soon inflamed against him, he was cited by Stokesley, bishop of London, to appear before him, and on his appealing to his own ordinary,

another citation was obtained out of the archbishop's court. He set out for the capital in the depth of winter, under a severe fit of the stone and cholic. On his arrival, he found that instead of being examined, as expected, about his sermons, a paper was put into his hands, which he was ordered to subscribe, declaring his belief in the efficacy of the masses for the souls in purgatory, of prayers to the saints, of pilgrimages to their sepulchres, &c. but he refused to sign it, and was dismissed with a copy of the articles. He was now regularly sent for three times a week, and tired out with the most captious questions: but at length a stop was put to their proceedings, by an order from the king, and he was soon after made bishop of Worcester. It was then usual for the bishops to make presents to the king of a purse of gold on New-Year's-Day: but Latimer, instead of the purse, presented Henry a New Testament, in which was a leaf doubled down to this passage, "Whoremongers and adulterers God will judge." He was soon after summoned to parliament, when the famous act of the six articles being passed, which gave an universal alarm to all the favourers of the Reformation, he resigned his see, and retired into the country. But being afterwards bruised by the fall of a tree, he was obliged to come to London to obtain the assistance of the most skilful surgeons, when having lost his patron lord Cromwell, he was sent to the Tower, where he was imprisoned during six years: but upon the change of the government under Edward VI. was set at liberty. He might now have resumed his see, but this he declined, and spent above two years with archbishop Cranmer, at Lambeth, where he was chiefly employed in hearing the complaints and redressing the injuries of the poor. In the beginning of queen Mary's reign he was cited to appear before the council; he therefore set out immediately, and as he passed through Smithfield, where the supposed heretics were usually burned, said cheerfully, "This place has long groaned for me." He was loaded with reproaches by the council, and sent to the Tower, where his usual cheerfulness did not forsake him; for a servant leaving his apartment, Mr. Latimer bid him tell his master, that if he did not take better care of him, he should certainly escape him. Upon this message the lieutenant, with some discomposure in his countenance,

came to desire an explanation, when Mr. Latimer answered, "I suppose, Sir, you expect that I shall be burnt; but if you do not allow me a little fire this frosty weather, I shall be starved." At length Cranmer and Ridley, who were prisoners in the same cause, were sent with Latimer to Oxford, in order to hold a public disputation, but were confined in the common gaol, and denied the use of books, pens, ink, and paper; and the dispute being ended, sentence was passed upon them, and he was ordered to be executed, on the 16th of October. When he and Ridley being brought to a fire, lighted on the north side of Balliol college, a sermon was preached, after which Mr. Latimer, throwing off his prison attire, appeared in a shroud, and having recommended his soul to God, delivered himself to the executioner, saying to the bishop of London, "We shall this day, my lord, light such a candle in England, as shall never be extinguished."

LATIN, a dead language, first spoken in Latium, and afterwards at Rome; and still used in the Romish church, and among many of the learned. This language is principally derived from the Greek, and particularly from the Eolic dialect of that tongue, though it has a great number of words which it borrowed from the languages of the Etrusci, Osce, and other ancient people of Italy; and foreign commerce and wars, in course of time, added a great many more. The Latin is a strong nervous language, perfectly suitable to the character of the people who spoke it: we have still works of every kind, admirably well written in the Latin, though there are vast numbers lost. The Latin is more figurative than the English, more harmonious than the French, less copious than the Greek, less pompous than the Spanish, less delicate than the Italian, but closer and more nervous than any of them. The Latin tongue was for a while confined almost wholly within the walls of Rome; nor would the Romans allow the common use of it to their neighbours, or to the nations they subdued: but, by degrees, they in time became sensible of the necessity of its being generally understood, for the convenience of commerce; and accordingly used their endeavours that all the nations subject to their empire, should be united by one common language, so that at length they imposed the use of it, by a particular law for that purpose. After the translation of the seat of the empire

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pire from Rome to Constantinople, the emperors of the East being always desirous of retaining the title of Roman emperors, appointed the Latin to be still used; but at length neglecting the empire of the West, they abandoned all the care of the Latin tongue, and used the Greek. Charlemagne coming to the empire of the West, revived this language; but at length it gave way, and the French took place of the Latin. The Latin, however, was prodigiously degenerated; for the incursions of the Goths and Vandals brought an inundation of foreign words into it. But that was not all: when it once got into the courts of justice, it was still worse handled; till at last, being introduced amongst the monks, it was debauched to that degree, that it was almost scandalous to use it. In this condition it was found at the Reformation, when Lud, Vives, Erasmus, &c. began to open the way for its recovery, since which time endeavours have been used to retrieve the pure Latinity of the Augustan age. See *Language*.

LATITAT, in law, a writ whereby all men in personal actions are called originally to the king's-bench: it is so called, as the defendant is supposed to lurk and cannot be found in the county of Middlesex to be taken by bill; but is gone to some other county, to the sheriff of which this writ is directed, commanding him to apprehend the defendant there.

LATITUDE, in geography, the distance of any place from the equator, measured in degrees, minutes and seconds, upon the meridian of that place; and is either north or south, according as the place is situated either on the north or south side of the equator. The latitude of a place is always equal to the elevation of the pole above the horizon. For the method of finding the latitude of a place from observations of the sun or stars, see *Observation*.

Complement of the LATITUDE, in geography, is the number of degrees, minutes, and seconds, which, added to the latitude, make it equal to 90° . Thus the complement of the latitude of London is $38^{\circ} 21'$; for $38^{\circ} 28'$ added to $51^{\circ} 32'$ is equal to 90° .

The complement of the latitude is always equal to the elevation of the equator above the horizon, or the angle intercepted between the plane of the equator and the plane of the horizon.

Circles of LATITUDE, in astronomy, are secondaries to the ecliptic, or circles

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drawn on the sphere of the heaven, perpendicular to the ecliptic, and intersecting each other in the poles of the ecliptic.

LATITUDE of a star or planet, in astronomy, is its distance from the ecliptic in degrees, minutes, and seconds, measured on the circle of latitude drawn through that star or planet, and may be either north or south, as the object is situated either on the north or south side of the ecliptic. The ecliptic is drawn on the common celestial globes, by which we may see what constellations it passes through; there are also usually six circles of latitude, which by their mutual intersections shew the poles of the ecliptic, as well as divide it into twelve equal parts, answerable to the numbers of months in a year. From what has been said it appears, that we must carefully distinguish the different notions of latitude, when applied to stars in the heaven, or places on the earth; that is, between latitude in astronomy, and latitude in geography; for in the heaven, or upon the celestial globe, it is the distance from the ecliptic; but upon the earth, or upon the terrestrial globe, it is the distance from the equator. Indeed, sometimes we consider the distance of the heavenly bodies from the celestial equator; but this is called declination. See *Declination*.

The latitude of a planet is either heliocentric, or geocentric.

Heliocentric LATITUDE of a planet is the latitude it would appear in to a spectator placed in the sun.

Geocentric LATITUDE of a planet is the latitude it appears in to an inhabitant of the earth.

North ascending LATITUDE of the Moon, when she proceeds from the ascending node towards her northern limit, or greatest elongation.

North descending LATITUDE is when the moon returns from her northern limit to the descending node.

South descending LATITUDE, when she proceeds from the descending node to her southern limit.

South ascending LATITUDE, when she returns from her southern limit to her ascending node.

And the same things hold good of the other planets.

LATITUDINARIAN, a person of moderation, with regard to religious opinions, who believes there is a latitude in the road to heaven, which may admit people of different persuasions.

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LATTEN, a name formerly given to the plates of iron covered with tin, and now usually called tin, of which our mugs, tea-cannisters, and the like, are made. The method of preparing those plates of tin, as they are called, is as follows: Plates of iron are prepared of a proper thinness; these are cut into squares fitted to receive the tinning; but it is not every kind of iron that will serve for this purpose, but only such as is most distensible, easily beating out to any degree of thinness when hot, and malleable even when cold, without danger of flying to pieces. Of this the Germans have large quantities, which they always select for this purpose. This sort of iron is first formed into square bars of an inch in diameter; these they beat out a little into flatness, and then cut into pieces, which they call *semelles* or *soles*. They fold these together, and having made them into parcels, containing forty pieces each, they beat them all at once with a hammer which weighs six or seven hundred weight. When they have done this, the principal part of the whole work is to prepare the leaves, now beat out to a proper thinness, so as that they shall readily receive the tin; for if there be but the smallest particle of dust on them, or only the slightest rust in any part, the tin will never fix there. This smoothing of the plates may be brought about by filing them; but that would be too expensive, wherefore they do it by steeping them in acid waters. Thus preparing a great number at a time, they leave them in this liquor till the surface is a little preyed upon by it, and then they are scoured with sand, which makes them very smooth and fine. There are other methods of making the iron rust; but whatever method is used, it is always necessary to scour them with sand as soon as it is done; and when they are thus cleaned, they must be immediately plunged into water, to prevent their rusting again; and they are to be left in this water till the instant in which they are to be tinned, or, in the language of the workmen, blanchèd. The people employed in this part of the operation are called blanchers, and the others, who assist at the cleaning the plates, the *scalers*. The Germans use no sort of preparation of the iron to make it receive the tin, more than the keeping it always steeped in water till the time; only when the tin is melted in the crucible, they cover it with a layer of a sort of

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suet, which is usually two inches thick, and the plate must pass through this before it can come to the melted tin. The first use of this covering is to keep the tin from burning; as, if any part should take fire, the suet would moisten it, and reduce it to its primitive state again. The blanchers say, this suet is a compounded matter. It is indeed of a black colour, and the whole secret of blanching was found to lie in the preparation of it; which was at length discovered to consist only in the first frying and burning it. This simple operation not only gives it the colour, but puts it into condition to give the iron a disposition to be tinned, which it does surprisingly.

The melted tin must also have a certain degree of heat; for if it is not hot enough, it will not stick to the iron; and if it is too hot, it will cover it with too thin a coat, and the plates will have several colours, as red, blue, and purple, and upon the whole, will have a cast of yellow. To prevent this, by knowing when the fire has a proper degree of heat, they might try with small pieces of iron; but, in general, use teaches them to know the degree, and they put in the iron when the tin is at a different standard of heat, according as they would give it a thicker or a thinner coat. Sometimes also they give the plates a double layer, as they would have them very thickly covered. This they do by dipping them into the tin, when very hot, the first time, and when less hot, the second. The tin which is to give the second coat must be fresh covered with suet, and that with the common suet, not prepared. *Phil. Transf. No. 106.*

LATTEN BRASS, plates of milled brass, reduced to different thickness, according to the uses it is intended for.

LATUS Rectum, in conics, the same with parameter.

LATUS TRANSVERSUM of the *Hyperbola*, a right line intercepted between the vertices of the two opposite sections; or that part of the common axis which is between the vertices of the upper and lower cones.

Such is the line *ED* (plate XXVII. fig. 1.) where also *Dd* and *Ee* may be the parameters or *latus rectums* belonging to the two opposite sections *DLRO* and *OEO R*.

To this *latus transversum* answers the longest diameter in the ellipse, which Apollonius calls the *transverse axis* or *diameter*.

LATUS

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LATUS PRIMARIUM, a right line belonging to a conic section, drawn through the vertex of the section of the cone, and within it, as the line E E or D D, fig. 1.

LAVANDULA, lavender, in botany, a shrubby plant, with its leaves set in pairs, the stalks square when young, and round when grown woody; producing on the tops of the branches naked spikes of blue labiated flowers, of which the upper lip is erect and cloven, the lower divided into three roundish segments.

LAVANDULA Minor five spica, lavender with oblong, very narrow, somewhat hoary, undivided leaves; a native of dry gravelly soils in the southern parts of Europe, common in our gardens, and flowering in July. The flowers of lavender have a fragrant smell, to most people agreeable, and a bitterish, warm, somewhat pungent taste: the leaves are weaker, and less grateful. They are often employed as a perfume; and medicinally, as mild stimulants and corroborants, in vertiges, palsies, tremors, and other debilities of the nervous system, both internally and externally. The flowers are sometimes taken in the form of conserve; into which they are reduced, by beating them, while fresh, with thrice their weight of double-refined sugar. Their fragrance is less injured by beating or bruising them than most of the other odoriferous flowers, but is nevertheless considerably diminished: the flavour of the leaves is of a much less destructible kind. Compound spirits of lavender, in which other aromatics are joined to the lavender, have been distinguished by the name of English or palsy drops. The college of London directs three pints of the simple spirit of lavender, and one pint of spirit of rosemary, to be digested on half an ounce of cinnamon, half an ounce of nutmegs, and three drams of red saunders, as a colouring ingredient: the college of Edinburgh orders a gallon and a half of rectified spirit of wine to be drawn over from three pounds of fresh lavender flowers, one pound of those of rosemary, and three ounces of lemon-peel; and afterwards three ounces of cinnamon, one of cloves, one of cubebs, and two of red saunders, to be macerated for three days in the distilled spirit. These preparations are taken internally, on sugar, or in any convenient vehicle, from ten to an hundred drops, and used externally in embrocations, &c.

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LAVANDULA Major five vulgaris, broad lavender, with longer, wider, and hoarier leaves, and much larger spikes, though smaller flowers: common in the southern parts of Europe, but rare among us. The name spike is applied by foreign writers to this species, by some of ours to the first.

* **LAUD (WILLIAM)** archbishop of Canterbury, the son of a clothier of Reading, in Berkshire, was born on the 7th of October 1573, and educated at Oxford. In 1600 he was ordained deacon, and in 1601 priest. In 1603 he was chosen proctor of the university of Oxford, and the same year made chaplain to Charles Blount, earl of Devonshire. In 1607 he was inducted into the vicarage of Stanford in Northamptonshire, and in the following year had North-Kilworth, in Leicestershire, given him. In 1608 he took the degree of doctor of divinity, and the same year was made chaplain to Dr. Richard Neal, bishop of Rochester. After several other preferments, he was in 1610 made prebendary of Westminster, and the next year bishop of St. David's. In 1616 he was translated to the see of Bath and Wells, and made dean of the royal chapel; and next year privy-counsellor to his majesty. In 1618 he was translated to the see of London; and in 1630 elected chancellor of Oxford. From this time he made it his business to adorn that university, and beginning with St. John's college, where he was educated, built all the inner quadrangle, except a part of the south side. He then erected that elegant pile of building at the west end of the divinity school, in which is the convocation-house, and Selden's library. He also gave the university, at several times, one thousand three hundred manuscripts in various languages, which he had purchased at a prodigious expence. After the murder of the duke of Buckingham, Dr. Laud became chief favourite to king Charles I. which whilst it augmented his power and interest, increased the envy and hatred he had raised against him. The superstitious ceremonies he used in the consecration of St. Catherine Cree church, London, the 6th of January 1630-1, gave great disgust; and his zeal in the prosecutions carried on in the high commission and star-chamber courts, against authors, printers, and divines, filled the minds of the people with resentment. But the prosecution of the king's printers, for leaving out the word

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not in the seventh commandment, in an edition of the English bible, gave great offence, though it was doubtless done without design. In 1633 he attended the king into Scotland, and was sworn a privy-counsellor for that kingdom. During his stay in Scotland, he formed the resolution of bringing that church to an exact conformity with the church of England. In the same year he succeeded archbishop Abbot in the see of Canterbury. In 1634, and the following year, the archbishop, by his vicar-general, performed his metropolitical visitation, in which, among other things, the church-wardens in every parish were enjoined to remove the communion table from the middle to the east end of the chancel, altar-wise, the ground being raised for that purpose, and to fence it with proper rails. On the 5th of February 1634-5, he was put into the great committee of trade, and the king's revenue; on the 4th of March following appointed one of the commissioners of the treasury; and on the 6th of March 1635-6, he received the staff of lord high-treasurer of England. A new parliament being summoned, met the 13th of April 1640, and the convocation the day following: but the commons launching out into complaints against the archbishop, and insisting upon a redress of grievances before they granted any supply, the parliament was dissolved the 7th of May. The convocation however continued sitting, and made seventeen canons, which were supposed to be formed under the immediate direction of the archbishop. In the beginning of the long parliament he was attacked on account of those canons, and they being condemned by the house of commons on the 16th of December 1640, "as containing many things contrary to the king's prerogative, to the fundamental laws and statutes of this realm, to the rights of parliament, to the property and liberty of the subject, and tending to sedition, and of dangerous consequence;" he was, on the 18th of December, accused by the commons of high treason, upon which he was committed to the custody of the usher of the black rod, and on the 21st of March sent to the Tower; and being at length tried before the house of lords, for endeavouring to subvert the laws, and to overthrow the Protestant religion, was found guilty, and beheaded on Tower-hill, Friday the 10th of January 1644-5, in the 72d year of his age. This learned prelate was temperate,

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in his diet, and regular in his private life; but his fondness for introducing new ceremonies, in which he shewed a hot and indiscreet zeal, his encouraging sports on Sundays, his illegal and cruel severity in the star-chamber and high-commission courts, and the fury with which he persecuted the dissenters, and all who presumed to contradict his sentiments, exposed him to popular hatred. Though he was charged with a design to introduce Popery, his answer to Dr. Fisher was the best ever printed against that religion.

LAUDANUM, a preparation of opium. See the article *Opium*.

LAVER, a sacred utensil in the temple of Jerusalem, consisting of a basin, whence they drew water by cocks.

LAUNCH, among sailors, a sort of boat used by the French, Italian, and Spanish ships; and is peculiar to those which are employed in the Mediterranean trade, being better fitted for the ports of that sea than a long-boat, than which it is generally much longer, and more flat-bottomed, and also sharper before.

LAUNCHING a *Ship or Boat*, pushing them into the water from an ascent.

When the ships of the ancients, particularly those of Greece, were launched, they were ornamented with garlands and flowers; the mariners also adorned with crowns, who shouted with loud acclamations, and other expressions of mirth and joy; and being purified by a priest, with a lighted torch, and egg and brimstone, or after some other manner, were consecrated to the god whose image they bore. In the launching of ships now-a-days, the same or similar expressions of joy and feasting are used, colours are displayed, and sometimes music performed.

LAURA, in church-history, a name given to a collection of little cells, at some distance from each other, in which the hermits in ancient times lived together in a wilderness.

These hermits did not live in community, but each monk provided for himself in his distinct cell. The most celebrated lauras mentioned in ecclesiastical history were in Palestine; as the laura of St. Euthymius, at four or five leagues distance from Jerusalem; the laura of St. Saba, near the brook Cedron; the laura of the Towers, near the river Jordan, &c.

LAUREATION, in the universities of Scotland, signifies the act of taking the degree of master of arts, which the students

Students are permitted to do after four years study.

LAURENCE, or *Canons regular of St. LAURENCE*, a religious congregation in France, said to have been founded by St. Benedict.

LAW denotes the command of some person or power, whose precept carries along with it the reason of obedience. The word is derived from the Saxon *l**aw***, which signifies the same thing. Thus the commands of God, a city, state, or sovereign power, are called their laws.

As all human actions depend upon the will, and the will of every single man is different; therefore to preserve decency and order among mankind, there should be some rule by which they are to be regulated; for otherwise it could not but give occasion to vast confusions. See *Government*.

This rule, or law is nothing but a decree, by which the superior obliges those subject to him to accommodate their actions to the directions prescribed therein. But that a law may exert its force in the minds of those to whom it is promulgated, it is requisite that the law-giver and the law be likewise known. The legislator of the laws of nature can be no other than the Creator of the universe. No man in civil society can be ignorant who it is that has power over him; and of the laws he has notice given him, by a publication plainly and properly made, in which these two things ought to be ascertained, that the author of the law is he who hath the supreme authority in the community, and that this or that is the true meaning of the law. The first is known, if it be promulgated with his own mouth, under his own hand, or if it be done by proper delegates regularly admitted to that office: they must be thus judiciously executed, and, besides that, contain nothing derogatory to the sovereign power. As to the true sense, after the greatest plainness used by the promulgers, an explication is to be sought of the legislator, or those who are publicly appointed to give judgment according to law. See *Judge*.

Every perfect law has two parts; the one directing what is to be done, or omitted; the other declaring the punishment incurred, by neglecting to do what is commanded, or attempting what is prohibited. And herein all the force of law consists. See *Punishment*.

Law may be divided, with respect to its authors, into divine and human: the

former may be considered as two-fold, natural or moral, and positive. Natural law is that which God has made known to mankind by the light of natural reason. Positive law is that which he has revealed by his prophets; such were the laws delivered to the Jews relating to the divine worship and polity peculiar to that people.

Civil or human laws, considered with respect to the legislator's two offices, of judging and compelling, may be divided into distributive and penal. Distributive law is that which gives every subject what properly belongs to him, forbidding others to injure him either in his privileges or property: and penal law is that which determines or appoints what punishments shall be inflicted on those who violate the distributive laws; it is mandatory, and speaks only to the public officers, or magistrates. The laws of any kingdom, or state, first began with the state itself; and if we consider the world as one universal society, or Europe as one great commonwealth, the law by which separate nations are governed, with respect to treaties, alliances, the sending ambassadors, &c. is called *jus gentium*, or the law of nations; but when it is considered as made up of particular states, the law which regulates the public order of each is called *jus publicum*; and that law which determines the private rights of men is called *jus civile*, or civil law. See *Civil Law*.

The laws of England are at present divided into the common law, which is the most ancient law of the kingdom; the statute law, made by the king and both houses of parliament; and particular customs in several parts of the kingdom: but our laws are more largely divided into the crown law; the law and custom of parliament; the common law; the statute law; reasonable customs; the law of arms; ecclesiastical or canon law; the civil law; the forest law; the law of marque and reprisals; the law of merchants; martial law, &c. See *Statute*, *Parliament*, &c.

Our laws have great respect to life, liberty, freehold, and inheritance; their use is to secure the continuance of those blessings we enjoy; and they have therefore a particular relation to persons and their estates, to crimes and misdemeanors, &c. See *Escape*, *Crime*, &c.

LAW of arms, a law which gives precepts how to proclaim a war, to attack the enemy, and to punish offenders in the camp.

L A W

LAWs of Nature or Motion, in physics, axioms or general rules of motion and rest, observed by all natural bodies in their actions on one another; of these Sir Isaac Newton has established the three following.

1. All bodies continue their state of rest or uniform motion in a right line, till they are made to change that state by some external force impressed upon them.

This law is no other than that universal property of bodies, called passiveness or inactivity: whereby they endeavour to continue the state they are in, whatever it be. Thus a top only ceases to run round on account of the resistance it meets with from the air, and the friction of the plane whereon it moves. And a pendulum, when left to vibrate in vacuo, where there is nothing to stop it but the friction arising from the motion of the pin on which it is suspended, continues to move much longer than in the open air.

2. The change of motion, produced in any body, is always proportionable to the force whereby it is effected; and in the same direction wherein that force acts.

This is an immediate consequence of this axiom, the effect is always proportionable to its cause. For instance, if a certain force produces a certain motion, a double force will produce double the motion, a triple force triple the motion. &c. If a body is in motion, and has a new force impressed on it in the direction wherein it moves, it will receive an addition to its motion proportional to the force impressed; but if the force acts contrary to its motion, the body will then lose a proportional part of its motion: again, if the force is impressed obliquely, it will produce a new direction in the motion of the body, more or less different from the former, in proportion to its quantity and direction.

3. Re-action is always contrary and equal to action; or the actions of two bodies upon each other are equal, and in contrary directions.

Thus, suppose a stone or other load to be drawn by a horse; the load re-acts upon the horse as much as the horse acts upon the load; for the harness, which is stretched equally between them both ways, draws the horse towards the stone as much as it does the stone towards the horse; and the progressive motion of the horse is as much retarded by the load, as

L A Y

the motion of the load is promoted by the endeavours of the horse.

LAWN, a large plain in a park, or adjoining to some grand seat. The most convenient situation is on the south or south-east side of the house. If the lawn be a square, three avenues may break out from three of the angles, and meet in the fourth angle opposite to the house: it may be bounded with walks or a single row of lime-set trees, at a good distance from one another. A circle is a good figure for a lawn, but must break off before it comes against the front. A triangle is a very proper figure, but should be obtuse or right-angled next the front. Many persons have preferred the lime-tree for this purpose, on account of their regular growth; but as the leaves of this tree often change their colour, and begin to fall very soon in the autumn, occasioning a great litter in the garden; and from the end of July the trees make but an indifferent appearance; so they are not to be esteemed for these plantations.

The elm, oak, beech, and chestnut, among the deciduous trees, are to be preferred to all others, as they keep their leaves late in autumn: and these are all of them large-growing trees, so are very proper for this purpose.

If there are some clumps of ever-green trees intermixed with the deciduous trees in this plantation, it will add to the beauty of it, especially in the winter season: the best sorts for this purpose are, the lord Weymouth's pine, the silver and spruce firs, which will grow fast, and become large trees: and as the two latter sorts always grow pyramidically, so they will have a good effect to the sight, when properly disposed with the deciduous trees: but as these generally feather out their branches near the ground, they should be planted where they do not obstruct the view of any distant objects. *Miller's Gardener's Dict.*

LAXATIVE MEDICINES, such as regard either the belly or entire habit, and produce this effect by some softening quality that takes away the tensity of the fibres, and facilitates the passage of the contents in the internal tube.

LAY-BROTHERS, among the Romanists, those pious but illiterate persons who devote themselves in some convent to the service of the religious.

LAY LAND, or **LEY LAND**, in husbandry, fallow-ground, or such as lies untilled.

LAY-MAN, one who follows a secular

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lar employment, or has not entered into holy orders.

LAYERS, in gardening, are tender shoots or twigs of trees, laid or buried in the ground, till having struck root, they are separated from the parent-tree, and become distinct plants. The manner of performing this operation is as follows.

1. Take some of the boughs, and lay them into the ground about half a foot deep in fine fresh mould, leaving them with the end of the layer about a foot or a foot and a half out of the ground, and keep them moist during the summer-season, and they will probably have taken root, and be fit to remove in autumn; if they have not by that time taken root, and they must lie long-r.

2. Tie a piece of wire hard round the bark of the bough, at the place you intend to lay in the ground; and twist the ends of the wire, so that they may not untie; and prick the place above the wire, through the bark with an awl in several places; and then lay it in the ground, as before directed.

3. Cut a slit upwards at a joint, as is practised in laying of carnations, which by gardeners is called *tonguing* the layers.

4. Twist the place which you design to lay in the ground like a withy, and lay it into the ground, as directed in the first way of laying.

5. Cut a place round about the bough that is designed to be laid, an inch or two, at the place that is most convenient to lay into the ground, and manage it as is directed in the first method of laying.

The season for laying hardy trees, that shed their leaves, is in October; but for such as are tender, in March; for evergreens, June or August are good seasons.

LAZARETTO, or **LAZAR HOUSE**, a public hospital for the reception of the sick poor; and in some countries it is a detached edifice for persons coming from places suspected of the plague, to perform quarantine in.

LAZULA, or **LAPIS LAZULI**, a sort of stone, from whence the celebrated colour called ultramarine is made. This is one of the ores of copper, the basis of which is a debased crystalline matter, coloured with the elegant and beautiful blue, which this matter gives in our experiment to all alkaline liquors. It is a very hard and compact stone, in so much as to come into the rank of those that take a high polish, and are not liable to be scratched by accidents; and

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therefore is worked into a number of different toys. It is found in detached lumps usually of the size of a man's fist, often smaller, and sometimes of four or five pounds weight: it is never covered with any coat or crust, but resembles those stones which have been washed off from whole strata, and smoothed or rounded by accidents afterwards. It is of a naturally smooth, and glossy surface; and its general colour is the elegant colour already mentioned; but this is variegated in a very beautiful manner with spots or clouds of white, and with veins of a fine shining gold colour. It has these variegations, in different degrees, in several masses, and in general most to be valued, as it has least of them; for though very beautiful to the eye, they are foreign to all the uses they are put to, except when it is cut as a gem. The white clouds or veins, for this matter is sometimes, though more rarely, disposed of in the last form, are usually of a dead and opake hue; but sometimes they are bright and pellucid as crystal; this last state of them adds greatly to the beauty of the stone: the yellow ones are always bright and glossy; they have been supposed by many to be veins of gold, and the stone has been thence called a gold ore; but they are in reality only marcasite. Sometimes that gold-like matter is not disposed in veins, but in spots and stars, and in this case the stone is the sapphire of the ancients; for they knew the gem we call the sapphire by a very different name, calling it the sky-blue beryl; and describing what they meant by the word sapphire to be a stone, opake, of a fesse blue, and variegated with spots of a gold colour in form of stars. All the variations of this stone are subject, besides, to other accidental foulnesses, and are sometimes debased to the state of a mere common blue copper-colour. The lapis lazuli is found in many parts of the world, but that of Asia and Africa, in both which countries it is frequent, is vastly superior, both in beauty and real value, to the Bohemian and German kind, which is brought too often to us in its place.

LEAD, *Saturn*, in natural history, a pale or livid white metal, soon losing its brightness in the air, and contracting a blackish or greyish ash-colour; very soft and flexible; unelastic, and unsonorous; the heaviest of all metallic bodies but gold, quicksilver, and platina: it is upwards of eleven times heavier than an

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equal bulk of water. It melts in a very small degree of fire, long before it grows red-hot: in a strong red heat it emits visible fumes. It loses of its malleability in proportion as it is heated: by nimble agitation, when it is just ready to melt, or when returning from a fluid to a consistent state, it may be divided into small grains, or powder. Granulated lead is commonly prepared, by pouring the melted metal into a wooden box rubbed on the inside with chalk, and strongly shaking it till it sets or becomes solid; when large quantities are prepared, a wooden trough is made use of. It is formed into round granules or shot, by pouring the melted lead into cold water, through a perforated plate; a little orpiment being added to the metal in fusion; this improves its hardness, and makes it run more regularly into globules without drawing a tail. All the calces and scorias of lead vitrify more easily than those of any other metal: exposed to a moderately strong fire, they quickly run into a transparent yellow glass. This glass, in fusion, powerfully dissolves and vitrifies the more refractory metallic calces and earths; and unless saturated with these kinds of additions, corrodes and sinks through the common crucible. If gold or silver be mixed with lead, and exposed to the fire, the lead scorifies, as it would by itself, and arises to the surface, so as to be raked off in the form of glass or litharge; at the same time carrying with it any imperfect metal that the gold and silver had been mixed with, but leaving those perfect metals themselves unhurt. Hence gold and silver are purified by means of lead from admixtures of the baser metals; and hence lead is called by the chemists, *balneum solis & luxæ, lavacrum regis & reginæ, sapa metallorum*. &c. The litharge met with in the shops is produced in those works where gold and silver are thus purified; and contains the heterogeneous metals which the gold or silver had been mixed with. Lead exposed for some time to the steam of vinegar or other vegetable acids, is gradually corroded into a white calx, which is the cerus or white lead of the shops. See *Cerus*. Lead is employed for various mechanic uses; as in thin sheets for covering buildings, for pipes, pumps, cisterns, statues, shot, bullets, windows, for securing iron bars in hard stones, for sundry kinds of large vessels for evaporation, and many other mechanic purposes. It has been observed that plants

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do not thrive so well in leaden, as in earthen and wooden vessels. Its principal uses in the chemical arts are, for promoting the vitrification of earthy and stony matters, in the making of glass, or in the smelting of ores, or in the glazing of earthen vessels; for the refining of gold and silver; for the eliquation of silver from copper; for forming with oil the basis of varnishes and paints. The effects of lead on the human body are dangerous: those who are exposed to its vapours in the fire, and even those who grind its calces, minium, cerus, and litharge, for the painters, are subject to violent gripes and constipations of the bowels, contractions of the limbs, and other disorders. Much more hurtful is the internal use of lead corroded or dissolved by acids, as cerus, saccharum saturni, the solution in vinegar called acetum lithargyrii, or the tincture drawn from the saccharum, with spirit of wine, commonly called tinctura antiphthifica. The saturnine preparations are applied externally with safety, as coolers, repellents, and desiccatives: its calces, dissolved in oils, form the basis of most of the official plasters. Culinary vessels, lined with a mixture of tin and lead, which is the usual tinning, are apt to communicate to acid foods pernicious qualities, and require to be used with great precaution. Lead is sometimes found in the earth native, or in its metallic form, though very rarely pure. Its common ores are nearly of the colour of lead itself, and appear composed of cubes or parallelepipeds, sometimes large and regular, sometimes irregular and small. There are lead ores also of a white, greyish, or greenish colour, and prismatic figure; but these are rarely met with. The ores of silver, copper, and other metals, except tin and iron, have often a lead ore intermixed. The lead is extracted by fusion in contact with the fuel; the furnace being sufficiently heated with wood or charcoal, the powdered ore is thrown in by degrees, and fresh fuel and ore occasionally supplied: the lead, revived by the inflammable matter of the coals, runs down into a basin at the bottom of the furnace; from whence it is laded out, and cast into iron mould, into large masses, called pigs of lead. All the common lead ores contain some silver and copper.

LEAF, a part of a plant, commonly very thin, and flat, growing in the spring, and falling off in autumn. Though there

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are some plants without leaves, as truffles and mushrooms.

The distinction of leaves, made by those who have written on botany, are the following.

A simple leaf is that which is not divided to the middle.

A compound leaf is divided into several parts, each resembling a simple leaf, as in liquorice, &c.

A digitated leaf is a compound leaf divided into several parts, all of which meet together at the tail, as in the hemp, black hellebore, &c.

A trifoliated leaf is a digitated leaf, consisting of three fingers, as the trefoil, &c.

A quinquefoliated leaf is a digitated leaf, consisting of five fingers, as in the quinque folium.

A pennated leaf is a compound leaf divided into several parts, each of which is called a lobe, placed along the middle rib, either alternately, or by pairs. When the middle rib is terminated by an odd lobe, it is said to be unequally pennated, as in the goats rue, &c. and equally pennated, when it is not terminated by an odd lobe, as in the cassia; when the lobes are all nearly of the same form and bigness, it is called an uniform pennated leaf, as in the liquorice; when they are not so, it is said to be disform, as in the agrimonia.

A winged leaf, is, as it were, divided into several pennated leaves, as in the orobus, &c.

A ramose leaf is that which is still farther divided than the winged leaf, as in the osmund royal, female fern, &c.

An entire leaf or lobe is that which has no division on its edges, as in the apple-tree, &c.

A sinuated leaf is that which is cut about the edges into several long segments, as in common mallows.

A ferrated leaf is that which is cut about the edges into several acute segments, resembling the teeth of a saw, as in the nettle, &c.

A crenated leaf is that which is cut about the edges into several obtuse segments, as in the betony, &c.

A lacinated or jagged leaf is that which is cut about the edges into several pretty deep portions, in an irregular manner, as in the horned poppy, &c. *Miller's Gardener's Dictionary.*

The leaves of plants are of the utmost consequence to the life of the whole. Air evidently passes in at the leaves, and goes through the whole plant, and out again

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at the roots. If the leaves have no air, the whole plant will die, as is easily proved by the air-pump; but in these experiments, if the leaves be left on the outside of the receiver, and parted by a hole cemented with wax, and have air, the plant will thrive, and grow, though its roots and stalk are kept in vacuo in water. The leaves of plants perform the necessary work of altering the water received in at the roots, into the nature of the juices of the plant; and hence it is, that the life of the plants depends so immediately upon their leaves. The husbandman often suffers for want of this knowledge. A crop of sainfoin is a very valuable thing, and its root being perennial, will yield him increase many years; but it is often destroyed at first, by suffering it to be indiscreetly fed upon by the sheep, which eating up all the leaves, the root remains without the means of a supply of air, and the whole perishes. Leaves being thus necessary to plants, nature has, in all perennial plants, provided a reversionary stock of them. The leaves of these plants are always formed in autumn, though they are not unfolded till the following spring. They then open and increase gradually, in proportion to the motion of the sap, and the quantity of pabulum it then receives to be circulated. These leaves may also, though not wholly appearing out of the bud, be sufficient for the extremely small motion of life, which the sap of perennial plants, that drop their leaves, has in winter. *Tull's Horse-boeing Husbandry.*

The leaves of many kinds of herbs and trees give a yellow dye to wool or woollen cloth that has been previously boiled with a solution of alum and tartar: weld in particular affords a fine yellow, and is commonly made use of for this purpose by the dyers, and cultivated in large quantity in some parts of England. There is no colour for which we have such plenty of materials as for yellow. Mr. Hellot observes, in his *Art de Teindre*, that all leaves, barks, and roots, which on being chewed discover a slight astringency, as the leaves of the almond, peach, and pear-trees, ash bark, especially that taken off after the first rising of the sap in spring, the roots of wild patience, &c. yield durable yellows, more or less beautiful, according to the length of time that the boiling is continued, and the proportions of alum and tartar in the preparatory liquor.

LEAGUE, a measure of length, containing more or less geometrical paces, according

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according to the different usages and customs of countries. A league at sea, where it is chiefly used by us, being a land measure mostly peculiar to the French and Germans, contains three thousand geometrical paces, or three English miles. The French league sometimes contains the same measure, and in some parts of France it consists of three thousand five hundred paces: the mean or common league consists of two thousand four hundred paces, and the little league of two thousand. The Spanish leagues are larger than the French, seventeen Spanish leagues making a degree, or twenty French leagues, or sixty-nine and an half English statute miles. The Dutch and German leagues contain each four geographical miles. The Persian leagues are pretty near of the same extent with the Spanish; that is, they are equal to four Italian miles; which is pretty near to what Herodotus calls the length of the Persian parasang, which contained thirty stadia, eight whereof, according to Strabo, make a mile.

League also denotes an alliance or confederacy between princes and states for their mutual aid, either in attacking some common enemy, or in defending themselves.

LEAK, among sailors, a cranny or hole through which water enters into a ship either through her deck or sides.

LEAKAGE, the state of a vessel that leaks, or lets water, or other liquor, out in or out.

Leakage, in commerce, an allowance of 12 per cent. in the customs, allowed to importers of wines for the waste and damage it is supposed to have received in the passage: an allowance of two barrels in twenty-two is also made to the brewers of ale and beer, by the excise-office.

LEAP-YEAR, the same with bissextile. See *Bissextile*.

LEASE, in law, a demise or letting of lands, tenements, or hereditaments unto another for life, term of years, or at will, for a rent reserved.

LEASE and RELEASE, as used in our law, signifies a certain instrument, in writing, for the conveyance of a right or interest in lands and tenements in fee to another.

LEASH, among sportsmen, denotes three creatures of any kind; but chiefly greyhounds, foxes, bucks, and hares. The term leash also signifies a line to hold in a hunting dog; and a small long thong of leather, by which a falconer holds his hawk.

LEE

LEATHER, the skin of several kinds of beasts dressed and prepared for the use of the various manufacturers, whose business is to make them up. The butcher and others, who slay off their hides or skin, dispose of them raw or salted to the tanner and tawer, and they to the shamooy, morocco, and other kind of leather-dressers, who prepare them according to their respective arts, in order to dispose of them among the curriers, glovers, harness-makers, coach-makers, saddlers, breeches-makers, gilt-leather-makers, chair-makers, shoe-makers, book-binders, and all in any way concerned in the article of leather. The three principal assortments of leather are tanned or tawed, and oil and alum-leather; and it may be affirmed, with great truth, that the skins of our own production, and those imported from our colonies, when dressed in this kingdom, make the best leather in the world, and that therefore this is an article of great importance to the trade of the nation.

LEAVEN, a piece of four dough, used to ferment and render light a much larger quantity of dough or paste.

LECTICA, in Roman antiquity, a vehicle in which people were carried in a reclining posture.

LECTURERS, in England, are an order of preachers in parish churches, distinct from the rector or vicar. They are chosen by the vestry, or chief inhabitants of the parish, and are usually the afternoon preachers.

LEDGER, the principal book where-in merchants enter their accounts. See *Book-Keeping*.

LEE, in the sea-language, that part of the hemisphere to which the wind blows, in opposition to the weather or windward side. This expression however is only used in a ship, when the wind crosses the line of her course at a greater or less angle; and hence

Under the LEE, implies farther to leeward, or farther from that part of the horizon from which the wind blows; as,

Under the LEE of the shore, i. e. at a short distance from that shore which lies to the windward, or from the land where the wind blows from. This phrase is commonly used to express the situation of a ship or boat which may be anchored, or sailing under the weather shore, where there is always smoother water and less danger of heavy seas than at a great distance from it.

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LEE

The Land appears under our LEE, i. e. at some distance from a ship on that side to which the wind bloweth, as it thwarts her way: and hence

To LEE-WARD, towards that part of the hemisphere which lies under the lee, or to which the wind bloweth.

LEE-WAY is the angle that the rhumb-line, upon which the ship endeavours to sail, makes with the rhumb upon which she really sails. This is occasioned by the force of the wind, or surge of the sea, when she lies to the windward, or is close hauled; which causes her to fall off and glide side-ways from the point of the compass the capes at. Thus, let N E S W (plate XXVII. fig. 2.) represent the compass, and suppose a ship at C capes at, or endeavours to sail upon the rhumb C a, but by the force of the wind and surge of the sea she is obliged to fall off, and make her way good upon the rhumb C b; then the angle a C b is the lee-way: and if that angle be equal to one point, the ship is said to make one point lee-way; or if equal to two points, the ship is said to make two points lee-way, &c.

The quantity of this angle is very uncertain; because some ships, with the same quantity of sail, and with the same gale, will make more lee-way than others; it depending much upon the mould and trim of the ship, and the quantity of water that she draws. However, the common allowances made for lee-way, are these: 1. If the ship be close hauled, has all her sails set, the water smooth, and a moderate gale of wind, she is supposed to make little or no lee-way. 2. If it blow so fresh, as to cause the small sails to be handed, it is usual to allow one point. 3. If it blow so hard that the tops must be close reefed, the ship then makes about two points lee-way. 4. If one top-sail must be handed, it is common to allow two and three quarters or three points lee-way. 5. When both top-sails must be handed, they allow about four points lee-way. 6. When it blows so hard as to occasion the fore-course to be handed, the allowance is between five and half and six points. 7. When both main and fore-courses must be handed, then six, or six and a half points must be allowed for her lee-way. 8. When the mizzen is handed, and the ship is trying a hull, she then makes her way good about one point before the beam, that is, about seven points lee-way.

LEE

* LEE (NATHANIEL) an English dramatic poet, was the son of a clergyman, and educated under Dr. Busby, at Westminster-school, from whence he was sent in 1668 to Trinity-college, Cambridge; but not succeeding to a fellowship, he left the university and went to court, where also meeting with disappointment, he had recourse to his pen, and wrote several plays with success. He then tried his talents at acting, but without applause. He was not only negligent of oeconomy, but so rakishly extravagant, as to be frequently plunged into the lowest depth of misery. At length becoming disordered in his senses, he was confined in the hospital of Bethlem, where he continued four years; after which he wrote his *Princess of Cleves*, and *The Massacre of Paris*, but was never perfectly recovered, and was reduced so low, that his chief dependence was a weekly stipend of ten shillings from the Theatre Royal. He died in 1690, in a drunken frolic by night in the street. He wrote eleven plays, in some of which he was assisted by Mr. Dryden, and all of them were acted with applause.

LEECH, *Hirudo*, in zoology. See *Hirudo*.

* LEEDS, a large town in Yorkshire, with two markets on Tuesdays and Saturdays, and two fairs on July 10, for horses and hard-ware; and on November 8, for horned cattle, horses, and hard-ware. It was made a corporation by charter, by king Charles I. under the government of one chief alderman, nine burgesses, and twenty assistants; and was again incorporated in the reign of Charles II. with the title of a mayor, twelve aldermen, and twenty-four assistants. It drives a great trade in the woollen manufacture, and the markets are large for cloth, and all sorts of provisions. It has three churches, and was once the seat of the kings of Northumberland. It stands on the river Air, over which there is a stone bridge. John Harrison, Esq; was a great benefactor to this town, in 1626, for he built a fine church, dedicated to St. John the Evangelist, endowed it with eighty pounds a year, and ten pounds a year to keep it in repair; also a house for the minister. He built an hospital for old persons who had been industrious, and of good conversation, which he endowed with eighty pounds a year, to which he added a chapel with ten pounds a year, for the master to read prayers in. He also built a free-school, and added a

library

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library thereto. He erected a stately cross for the conveniency of the market, and left the residue of his estate, being thirty pounds a year, in trust for such of his relations who should fall to decay. Leeds sends two members to parliament, and is twenty-five miles west-south-west of York, and one hundred and ninety-six north of London.

LEEK, a garden plant, called by botanists porrum. See the article *Porrum*.

Leeks are commonly sown along with onions; the onions growing up first are pulled up, so that the leeks have room to grow to their full size.

LEES, the more gross and ponderous parts of liquors, which, being separated by fermentation, fall to the bottom.

LEET, *Leet*, a small court held within a manor, and called the king's court, because its authority to punish offences originally belonged to the crown, from whence it derived to inferior persons. See *Court-Leet*.

LEG, *Crus*, in anatomy, includes the whole of the lower extremities, from the os innominatum to the toes, being commonly divided into the thigh, leg, and foot. See *Thigh* and *Foot*.

The leg consists of three bones, the tibia, fibula, and rotula. The tibia is a long, thick, triangular bone, situated at the anterior internal part of the leg, and continued nearly in a straight line from the thigh bone, to support the whole superior fabric. The fibula is the small long bone, on the outside of the leg, opposite to the external angle of the tibia, being irregularly triangular. This bone serves chiefly for the origin and insertion of muscles, and for the more firm articulation of the foot. The rotula is the small flat bone situated at the anterior part of the joint of the knee.

LEGACY, any thing that is particularly given or bequeathed by a last will and testament.

LEGATE, a cardinal or bishop, whom the pope sends as his ambassador to foreign princes. There are three kinds of legates, viz. legates a latere, legates de latere, and legates by office, or legati nati: of these the most considerable are the legates a latere, the next are the legates de latere. See the article *A Latere*.

Legates by office are those who have not any particular legation given them, but who by virtue of their dignity and rank in the church become legates; such are the archbishops of Rheims and Arles;

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but the authority of these legates is much inferior to that of the legates a latere.

LEGATUS, in Roman antiquity, a military officer who commanded as deputy of the chief general.

LEGEND, a ridiculous story told by the Romanists concerning their saints, and other persons, in order to support the credit of their religion.

LEGER-LINE, in music, one added to the staff of five lines, when the ascending or descending notes run very high or low: there are sometimes many of these lines both above and below the staff, to the number of four or five.

LEGGIARDO, or LEGGIARDAMENTE, in music, signifies to play or sing in a lively, brisk, and gay manner.

LEGHORN, a sea-port town of Italy, in the duchy of Tuscany. It is well built, and the streets are strait; and though it was formerly only a wretched village, on account of the standing waters which surrounded it, it is now become a considerable trading place, and is much frequented by foreign merchants, who come there on account of trade, and perhaps they may choose this place to reside in, because no one here can be arrested for debt. It was fortified by Ferdinand Medicis, who rendered the harbour as safe from the insults of enemies, as it is against the violence of the winds; for no ships can enter into it, except one at a time, and the entrance is defended by a strong citadel. The same prince caused a canal to be cut from this city to Pisa, which not only drew off the standing water, but is of great advantage to merchants, to convey their merchandize on. This harbour always swarms with ships, and there are here people of all nations; also a great number of gally-slaves, who are generally Turks. The city is defended by three considerable forts, and has two harbours, the one for galleys, and the other for merchantmen. There is a fine statue of duke Ferdinand, who holds four slaves in chains, that lie at his feet. The great duke's palace is very fine and commodious, and the governor of the city resides in it. The inhabitants are in such want of good water, that they are obliged to send for it to Pisa. The foreign merchants pay no duty, it being a free port, but the inland duties are very high, it being the town from whence the great duke has his principal revenue, even the very ice-merchant pays a thousand pounds a year, and the tobacco-merchants ten thousand. In the hospital where the galley slaves lie, there

there are three little mosques, where the Turks worship in their own way. The trade here consists chiefly in silks, coffee, cotton, aniseed, alum, fine wax, essences, straw hats, wine, and oil. The Jews here are very numerous. The Greeks and the Armenians have churches here, in which divine service is performed after their own manner, not to mention the fine synagogue and schools of the Jews. It is seated on the Mediterranean sea, ten miles south of Pisa, and one hundred and forty-six north-west of Rome. Long. 10. 25. E. Lat. 43. 33. N.

LEGION, in Roman antiquity, a body of foot which consisted of ten cohorts, and containing at different times from 3000 to 6000.

LEGISLATOR, or Law-giver, he who frames laws for any state or kingdom.

LEGITIMATION, an act whereby illegitimate children are rendered legitimate.

LEGUME, *Legumen*, among botanists, denotes a pericarpium of an oblong compressed figure, formed of two valves, joined by a visible suture both on the upper and under parts, and having the seeds affixed to the upper limbs of the two valves, in an alternate order.

LEGUMINOUS, an appellation given to all plants whose fruit is a legume.

* **LEICESTERSHIRE**, a county of England which lies almost in the centre, and is divided into two nearly equal parts by the river Soar. It is about ninety-six miles in circumference, and is bounded on the east by Rutland and Lincolnshire, on the north by Nottingham and Derbyshire, on the west by Warwickshire, from which it is parted by the Roman military way called Watling-street, and on the south by Northamptonshire. It contains six hundreds, twelve market-towns, and one hundred and ninety-two parishes. This county sends but four members to parliament, two for the county, and two for Leicester. Its principal rivers are the Welland, the Soar, and the Avon. The air of this county is sweet and healthy, and the soil generally good, and yields plenty of corn, beans, and grass; but the north-east part, which abounds with coal, is for the most part barren and rocky. They have no manufactures in this county, except stocking-weaving, so that the shepherd and the husbandman are the chief employments. However a great deal of wool is sent from hence to many parts of England.

* **LEICESTER**, the county town of Leicestershire, is seated on the river Soar. It is an ancient borough, having had its first charter from king John, and is governed by a mayor, a recorder, twenty-four aldermen, forty-eight common-councilmen, a steward, a bailiff, a town-clerk, and a solicitor. The freemen of this town are exempted from toll, in all fairs and markets in England. It was the Roman *Ratacoritanorum*; since that time it was so large a city, as to contain thirty-two parish churches, and in the year 680 it was the see of a bishop; it had also walls, and a strong castle; both which were demolished by Henry II. in 1173, on account of a rebellion of the earl of Leicester, who fortified this place in defiance of the king. Near the castle, Henry earl of Lancaster, in the reign of Edward III. founded a fine collegiate church, which was ruined at the time of the suppression of the religious houses: he also erected an hospital, which still subsists, by means of certain stipends paid out of the duchy of Lancaster. Here is also a well endowed hospital, founded by Sir William Wigstone, a merchant of this town. There is but one principal street, which runs from north-west to south-east; the other parts of the town consisting chiefly of cross streets; there are five churches, and three markets, on Wednesdays, Fridays, and Saturdays; and the fairs are on May 12, and July 5, for horses, cows, and sheep; on October 10, for horses, cows, sheep, and cheese; and on December 8, for horses and cows. The only manufacture here is weaving of stockings, which have been lately greatly improved, and is become very large. Leicester is still the largest and most populous town in the county. Here have been found many Roman antiquities and coins. It is thirty-two miles north-west-by-north of Northampton, twenty-four south-east-by-south of Derby, and ninety-nine north-west-by-north of London. Long. 1. 7. W. Lat. 52. 37. N.

* **LEIPSICK**, a city in the circle of Upper Saxony, in Germany. It is one of the most populous and handsome cities in Germany, it being situated in a pleasant fruitful plain, at the confluence of three small rivers, namely, the Elster, the Pleissa, and the Barda. The houses are built with stone or brick, six or seven stories high, and each floor is a tenement, from the cellar to the garret. The cellars are generally let to Italians, who

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deal in wines, fruit, and merchandize from Italy. The streets are large, neat, and clean; likewise the suburbs are very pleasant. There are a great number of pleasure-gardens round the town, where the chief merchants have houses to entertain and regale their friends, in a very splendid manner; these gardens are open to all strangers, who have liberty to spend their evenings there, giving a small gratification to the gardener. They have an old castle, which is of no great strength, any more than the town itself, which in the last war surrendered to the king of Prussia, without making any defence. The churches are but poor, except that of St. Nicholas, which is thought to be the finest Lutheran church in Germany. The great market-place is adorned with merchants houses, which look like palaces; the rest of the buildings worth notice are the exchange, the stadt-house, and the town-library. There is a famous university in this city, very much frequented by foreigners: the university library, the college of St. Paul, and the anatomical theatre are well worth observation. The German language is spoken here in great perfection, and they have erected an academy to ascertain the purity of the language. They have three great fairs here every year, the first of which begins on New-year's day; the Easter fair begins the third Monday after Easter; and Michaelmas fair begins on the first Sunday after St. Michael's day; these fairs all continue for fifteen days, but the greatest sales are the week before the fair, and the second week is employed in payments. By means of these fairs, Leipstick is a repository of merchandize of every kind. The manufactures here are stuffs, gold and silver lace, and several other articles too tedious to mention. They have likewise wool enough to export into distant parts, even as far as Swisserland. The inhabitants of Leipstick are generally rich, and live in a splendid manner. The women dress vastly gay, with a profusion of gold and silver lace. There are a great number of chariots in the town, which belong to physicians, university professors, and merchants, for the nobility are not allowed to have houses here. It is thirty-eight miles south of Wittemberg, and two hundred and fifty north-west from Vienna. Long. 12. 55. E. Lat. 51. 19. N.

• LELY (Sir PETER) a very eminent painter of the English school, was born at Soest, in Westphalia, in 1617,

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where his father, a captain of foot, was in garrison. His name was Vander Vaas; but being born at the Hague, at a perfumer's who kept the sign of the Lily, he received the appellation of captain Du Lys, or Lely, which became the proper name of his son. He received his first instructions in painting from one De Grebber. The great encouragement given by king Charles I. to painting, drew him to England in 1641, where he at first painted landscapes with small figures, and also historical compositions; but finding face-painting more encouraged, he applied to it, and soon excelled all his contemporaries; which procuring him great business, prevented his going to Italy, as he had intended, on which he procured the best drawings, prints, and paintings of the most celebrated Italians, and having at length the best collection of any one of his time, acquired an admirable style by his daily studying the works of those great masters. Thus in the correctness of his draughts, and in beauty of colouring, the graceful airs of his heads, the pleasing variety of his postures, and in the gentle and loose management of his draperies, he excelled most of his predecessors, and will be a pattern to all succeeding artists. But the critics remark, that most of his faces have a languishing air, long eyes, and a drowsy sweetness peculiar to himself. He was a good history-painter, and his crayon draughts are also admirable. He was much favoured by king Charles II. who made him his principal painter, and conferred on him the honour of knighthood: he was also esteemed by persons of the greatest eminence in the kingdom. He died at London of an apoplexy, as he was drawing the duchess of Somerset, in the year 1680, and was buried in Covent-Garden church, where he has a marble monument.

LEMMA, in mathematics, a previous proposition laid down, in order to clear the way for some following demonstration; and is prefixed either to the theorems or problems.

LEMNA, duck-weed, in botany.

LEMON, *Limon*, in botany, a genus of trees with large stiff leaves like the citron, without any appendage at the bottom; the flower consists of many leaves, which expand in form of a rose: the fruit is almost of an oval figure, and divided into several cells, in which are lodged hard seeds surrounded by a thick fleshy substance, which, in general, is full

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of an acid juice. All sorts are propagated by budding or inarching them either on stocks of lemons or citrons produced from seeds, but they will not readily unite on orange stocks; for which reason the citrons are preferable to either oranges or lemons for stocks, as they readily join with either sort; and being of larger growth, cause the buds of the other sorts to be much stronger than if they were on stocks of their own kind. The culture of the lemon is the same with that of the orange-tree, with this difference only, the former being hardier than the latter, will consequently bring their fruit to maturity with us much better than the orange will, and therefore require to have a greater share of fresh air in winter; for which reason they should always be placed nearer to the doors or windows of the green-house: and in some curious gardens these trees have been planted against walls, where, by covering them with glasses in winter, and protecting them from severe frost, they have produced plenty of large fruit: as these trees generally produce stronger shoots, so they require more water to be given them than the orange; but as to the tender sorts, they must be treated with a little more care, otherwise their fruit will fall off in winter, and come to nothing. See *Orange*.

LEMONADE, a liquor prepared of water, sugar, and lemon or citron-juice: it is very cooling and grateful.

LEMURIA, a festival of the ancient Romans, solemnized on the ninth of May, to pacify the manes of the dead, who were the lemures or phantoms that came in the night to torment the living.

LENITIVE MEDICINES, among physicians, those of a mild, softening, and relaxing nature, and destitute of all acrimony.

LENS, in dioptrics, a small oblong glass like a lentil; it is a medium terminated on one side by a spherical surface, on the other by a surface either plain or spherical. The axis of a lens is a line passing perpendicularly through both its surfaces: thus the line *FG* is an axis common to all the five. Lenses are distinguished into two general kinds, convex and concave: the first and second lenses are considered as convex; the third and fourth as concave: the last, if its convexity is greater than its concavity, is looked upon as convex; if on the contrary, it is considered as concave. A lens is always supposed to consist of a medium denser than the circumambient

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one, unless where the contrary is expressed. When parallel rays fall upon the surface of a convex lens, they are refracted towards each other in passing through it, and thereby collected to a focus on the other side. If the lens is plain on one side and convex on the other, the rays are refracted the same way, but in a less degree. When parallel rays fall upon a concave lens, they are refracted from each other in passing through it, and thereby made to diverge, proceeding as from an imaginary focus on the first side of the lens. If the rays diverge before they enter the lens, their imaginary focus is then nearer the lens than that of the parallel rays. If they converge before they enter the lens, proceeding towards some distant point in the axis, they are then rendered less converging; if they converge to a point at the same distance from the lens with the focus of parallel rays, they then go out parallel; if to a point at less distance, they remain converging, but in a less degree than before they entered the lens. When the rays enter the lens diverging the nearer their radiant point is to it, the nearer also is their imaginary focus after refraction, and vice versa. If the lens is plain on one side and concave on the other, the rays suffer a like refraction in each case, but in a less degree. But the method of determining the exact focal distance of lenses is to be had from the propositions laid down and demonstrated in the article *Refraction*. When a ray passes through a medium terminated by two plane and parallel surfaces, it is refracted one way in going out of the second, as much as it was the other in entering the first; and, therefore, proceeds afterwards, not in the same direction, but in one which is parallel to that which it had before.

LENT, a solemn time of fasting in the Christian church, observed as a time of humiliation before Easter, the great festival of our Saviour's resurrection. Those of the Romish church, and some of the protestant communion, maintain, that it was always a fast of forty days, and as such, of apostolical institution. Others think it was only of ecclesiastical institution, and that it was variously observed in different churches, and grew by degrees from a fast of forty hours, to a fast of forty days. This is the sentiment of Morton, bishop Taylor, Du Moulin, Daillé, and others.

LENTISCUS, the lentisk or mastich-tree, in botany, a genus of trees, very

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nearly allied to the terebinthus, or turpentine-tree, in its characters, but differing in that the leaves are pennated; but there is no single leaf to terminate the end of each compound one. See *Masticb.*

LEO, in astronomy, one of the twelve signs of the zodiac, the fifth in order, containing, according to Ptolemy, thirty-two stars; according to Tycho, thirty-seven; and, in the Britannic catalogue, there are no less than ninety-four. The star called the lion's heart, cor leonis, regulus, and basilicus, is a fixed star of the first magnitude.

LEONTODON, dandelion, in botany. It is said to have much the same virtues with endive. See *Endive.*

LEONURUS, lion's tail, in botany, a genus of plants.

LEOPARD, a beast of prey, with the spots on the upper part of the body round, and the lower ones virgated. It is a very nimble, as well as fierce animal, so that scarce any thing escapes it. Authors called the male pardus, and the female panthera.

LEOPARD'S BANE, *doronicum*, in botany.

LEPIDIDIUM, dittander, in botany.

LEPIDOPTERA, in zoology, an order of insects, with four wings, which are covered with imbricated squamulae: add to this, that the mouth is commonly spiral. Under this order are comprehended the butterflies, and phalaenæ, or moths.

LEPROSY, *Lepre*, in physic, a higher degree of cutaneous disorder than an itch, the same with *lepra arabum*. There is a wide difference between the itch and leprosy, and that ulcerous disorder in which white fordid ulcers, seizing principally the muscular parts, such as the back, arms, thighs, &c. discharge a putrid sanies, and sometimes appearing in one limb, and sometimes in another, often continue for many years. Large quantities of worms are also found lodged within these ulcers, so that they can hardly be extirpated. The lepra and elephantiasis are diseases nearly alike. The method for the cure of these and such like malignant disorders is to discharge the mias of corrupt, glutinous, and acrid humours, by sufficient bleeding and abstinence, by purges both gentle and drastic, and then by a proper regimen. But if the growing and refractory state of the disease raises a suspicion of malignity, there are no remedies more power-

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ful, if the patient's strength permit, than mercury and its preparations. Some make an unguent of live mercury thoroughly extinguished with pomatum, adding flowers of sulphur and camphire, with which the joints, ancles, &c. are to be well rubbed. But others choose a better and safer method of using mercury internally; whilst, by a previous preparation of the body, by alteratives, correctors, and evacuates, *mercurius dulcis*, with double the quantity of crabs-eyes, and diaphoretic antimony, is duly exhibited. This intention is also answered by *mercurius solaris* and *jovialis*, of which a few grains, with conserve of roses, may be exhibited every morning, drinking in bed, after it, a pint of some proper decoction. Each of these methods requires a very temperate air, a spare diet, and abstinence from pinguious or boiled flesh and acids. But if the patient be either an infant, or too old, both the antients and most judicious of the moderns have greatly extolled preparations of milk, especially asses milk, the whey of cows and goats milk, and milk mixed with water. Whenever these exanthematic disorders are supported by a scorbutic lues, or hypochondriac affection, a much greater advantage will be procured, when the milk diet is so managed as to alleviate the other disorder with which they are complicated: for which purpose the best way is the due use of medicinal waters, especially those of a temperate kind, impregnated with a saline and spirituous principle. But if such waters cannot be had, the end will be best answered by a decoction of such herbs as deplete the blood, and are particularly destined to these disorders, with milk or whey, both sweet and somewhat sour. *Francis Hoffmann.*

LEPUS, in astronomy, a constellation of the southern hemisphere; comprehending twelve stars, according to Ptolemy; thirteen, according to Tycho; and nineteen in the Britannic catalogue.

LESSONS, among the ecclesiastical writers, portions of the Holy Scripture, read in Christian churches at the time of divine service.

LETHARGY, *Lethargus*, in physic, a kind of disorder wherein the person affected labours under a heavy and perpetual sleep, with scarce any interval of waking. There are several species of this disorder; the chief are *coma vigil*, *coma somnolentum*, *carus*, and a lethargy.

LETHE, in the ancient mythology,

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one of the rivers of hell, signifying oblivion or forgetfulness; its waters having, according to poetical fiction, the peculiar quality of making those who drank of them entirely forget every thing that was past.

LETTER, *Litera*, a character either in print or writing, which men have agreed on to signify something, by joining of which they make their thoughts known to one another. The alphabet of every language consists of a certain number of letters or characters, which have a different sound, form, and signification. See *Alphabet*. Some say that Fohi, first king among the Chinese, and 2950 years before Christ, invented letters, having writ in their language a book called Yexim. Others think from mummies and obelisks, that hieroglyphics were the first manner of writing, they being prior to Moses, as most of the obelisks and pyramids were made, while the Israelites were in Egypt. The Chaldeans or Phœnicians, it is very likely, were the masters of the Egyptians; whence it was that those letters were called Phœnician by the Greeks: yet, according to Diodorus Siculus, they only changed the form of letters.

Pliny will have the most ancient letters to have been the Assyrian; and that Cadmus, about two hundred and fifty years before the Trojan war, brought sixteen of them from Phœnicia into Greece, namely, A, B, C, D, E, F, I, L, M, N, O, P, R, S, T, U. Simonides, Evander, and Demaratus were the first that brought letters into Italy.

The letters F, G, H, K, Q, X, Y, Z, were formerly unknown to the Romans. One letter was intended to signify only one sound, and not as at present now to express one sound, and then another, which has introduced that confusion which has rendered the learning of our modern tongues extremely difficult.

Grammarians distinguish their letters into vowels and consonants; into mutes, diphthongs, liquids, and characteristics. Printers distinguish their letters into capital, majuscule, initial, or upper-case letters, which serve for the titles or books, &c. and minuscule, small or under-case letters, which are again divided into pearl, nonpareil, pica, &c.

Letters, again, are of various sizes, each of which are sometimes cast with the Roman, sometimes Italic, sometimes an English, or black letter face. There are also bodies with the Greek, Hebrew,

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Arabic, the music face, &c. A set or fount of any of these sizes includes current letters, capitals, numeral figures, points, spaces, &c. See *Fount*.

Letters are the elements of grammar; an assemblage of these composes syllables, of those words, and of these sentences.

Numeral LETTERS, those used instead of cyphers, in order to express numbers, as C, D, I, L, M, V, X.

LETTER also denotes the same with epistle, a writing addressed to any person.

LETTER of Attorney, a writing authorizing any person to do some lawful act for another, as to give seizin of lands, receive debts, sue a third person, &c.

LETTER of Credit, among merchants, a letter wrote by a merchant or banker to his correspondent abroad, requesting him to credit the bearer as far as a certain sum. See *Credit*.

LETTER of Licence, an instrument or writing granted by a person's creditors, allowing him a certain time for the payment of his debts; by which means he is enabled to prosecute his business, without fearing an arrest.

LETTER of Mart, or *Marque*, a letter granted to one of the king's subjects, under the privy-seal, empowering him to make reprisals for what was formerly taken from him by the subjects of another state, contrary to the law of mart. See *Marque*.

LETTERS-PATENT, or **OVERT**, writings sealed with the great seal of England, so called, because they are open with the seal affixed to them. These are granted to authorize a man to do, or enjoy, what of himself he could not do.

LETTUCE, *Leuca*. in botany, a genus of plants. It would be beside my purpose to mention in this place the several sorts of lettuce that are to be found in botanic writers, many of which are plants of no use, and are never cultivated but in botanic gardens for variety; and some of them are found wild in many parts of England. I shall therefore pass over those here, and only mention the several sorts which are cultivated in the kitchen garden for use: 1. Common or garden lettuce. 2. Cabbage lettuce. 3. Cilicia lettuce. 4. Dutch brown lettuce. 5. Aleppo lettuce. 6. Imperial lettuce. 7. Green capuchin lettuce. 8. Versailles or upright white cos lettuce. 9. Black cos. 10. White cos. 11. Red capuchin lettuce. 12. Roman lettuce. 13. Prince lettuce. 14. Royal lettuce. 15. Egyptian

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fian cos lettuce. The first of these sorts is commonly sown very early for cutting, to mix with other small salad herbs, and is only different from the second sort, in being a degeneracy therefrom; or otherwise the second is an improvement by frequent cultivation from the first: for if the seeds are saved from such plants of the second sort as did not cabbage closely, the plants produced from that seed will all degenerate to the first sort; which is by the gardeners called lapped lettuce, to distinguish it from the other, which they call cabbage lettuce. The cabbage lettuce may also be sown at different times of the year, in order to have a continuation of it through the whole season.

The Cilicia, imperial, royal, black, white, and upright cos lettuces may be sown at the following times: the first season for sowing these seeds is at the end of February, or the beginning of March, upon a warm light soil, and an open situation; i. e. not overshadowed with trees. You may also continue these sorts through the season, by sowing them in April, May, and June; observing to sow the late crops in a moist shady situation, otherwise they will run up to seed before they grow to any size; but in August, toward the latter end, you may sow of these sorts, to abide the winter. The most valuable of all the sorts of lettuce in England are the Egyptian green cos, and the Versailles or white cos, the Cilicia, and black cos; though some people are very fond of the royal and imperial lettuces; but they seldom sell so well in London markets as the others, nor are so generally esteemed. Indeed of late years, since the white cos has been commonly cultivated, it has obtained the preference of all the other sorts, until the Egyptian green cos was introduced; which is so much sweeter and tenderer than the white cos, that it is by all good judges esteemed the best sort of lettuce known. This sort will endure the cold of our ordinary winters full as well as the white cos; but at the season of its cabbaging, if there happens to be much wet, this sort being very tender, is very subject to rot. The brown Dutch and green capuchin lettuces are very hardy, and may be sown at the seasons as was directed for the common cabbage lettuce; and are very proper to plant under a wall or hedge to stand the winter; where many times these will abide, when most of the other sorts are destroyed: and therefore they will prove very acceptable at a time when few other

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sorts are to be had. The red capuchin, Roman, and prince lettuces are pretty varieties, and cabbage very early; for which reason a few of them may be preserved; as may some of the Aleppo, for the beauty of its spotted leaves; though very few people care for either of these sorts at table, when the other more valuable ones are to be obtained. *Milner's Gardener's Dict.*

LEVARI FACIAS, a writ directed to the sheriff for levying a certain sum of money upon the lands, &c. of a person who has forfeited his recognizance.

LEVATOR *scapulae proprius*, in anatomy, or rather according to Winslow, *angularis*, a long and pretty thick muscle, about two fingers in breadth, lying above the superior angle of the scapula, along the posterior lateral part of the neck of that bone.

LEVATORES Ani, in anatomy, are muscles that arise fleshy from each side of the ossa pubis, internally within the pelvis, as also from part of the os ischium and sacrum; from those places, like lines drawn from a circumference towards a center, its fibres descend, over the musculi marsupiales, to their implantation at the lower end of the intestinum rectum in the anus. They chiefly serve to suspend and draw the anus upwards, lest the faeces should be burthensome to the sphincter.

LEUCADENDRON, in botany, a genus of plants.

LEVEL, an instrument to draw a line parallel to the horizon, whereby the difference of ascent or descent between several places may be found, for conveying water, draining fens, &c. The word is derived from the Latin, *libella*, the cross beam in a balance, which, to be just, must stand exactly horizontal.

Air LEVEL, that which shews the line of level by means of a bubble of air inclosed with some liquor in a glass tube, whose two edges are sealed hermetically. When the bubble fixes at a mark made exactly in the middle of the tube, the plane where it is fixed is level; otherwise the bubble will rise to one end.

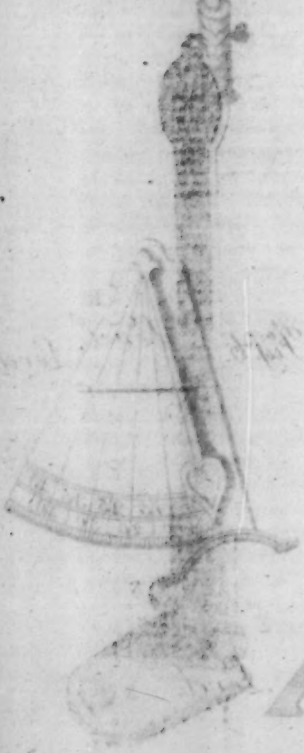
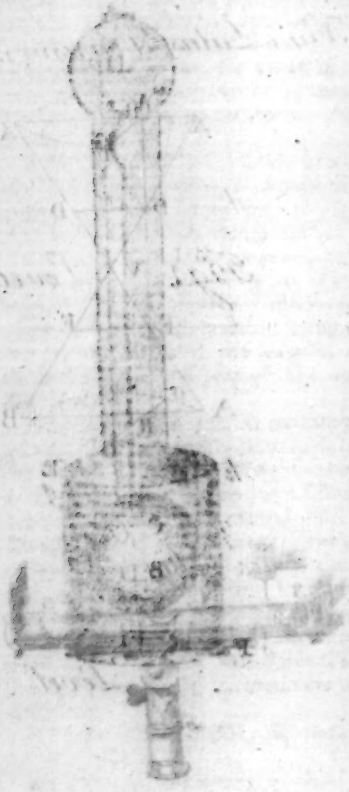
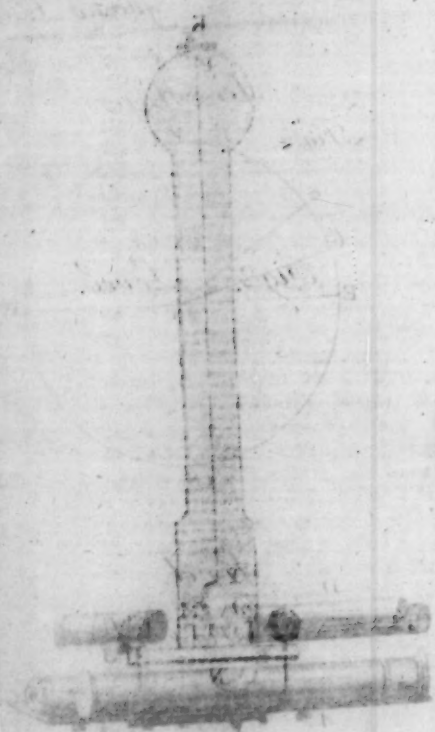
The liquor with which the tube is filled is oil of tartar, or aqua-seconda; these not being liable to freeze.

Air LEVEL, with sights, consists of an air level (plate XXVII. fig. 3.) about eight inches long, and seven or eight in diameter, set in a brass tube, with an aperture in the middle. The tubes are carried in a strong straight ruler, a foot long,



Leveling Instrument

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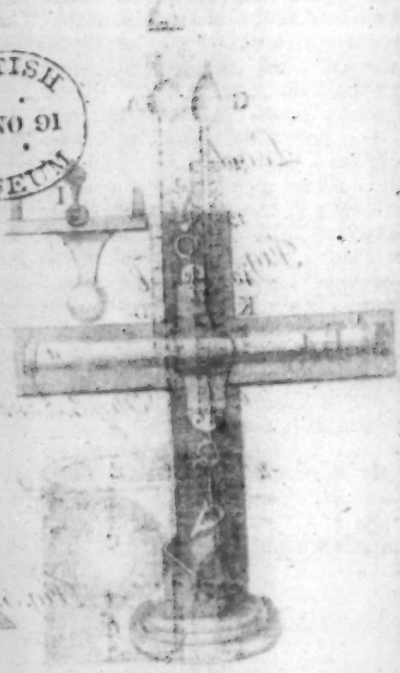
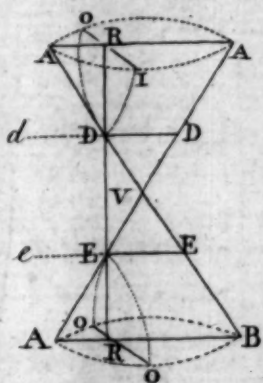
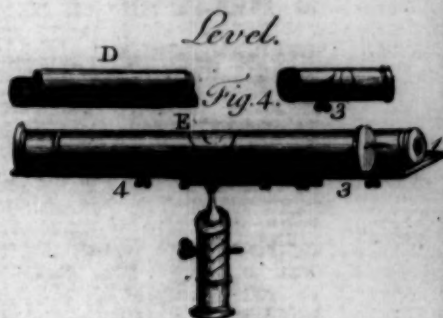
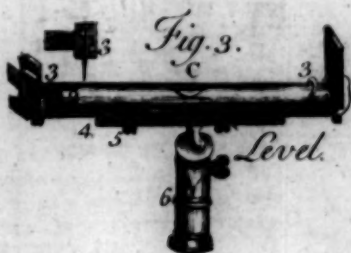
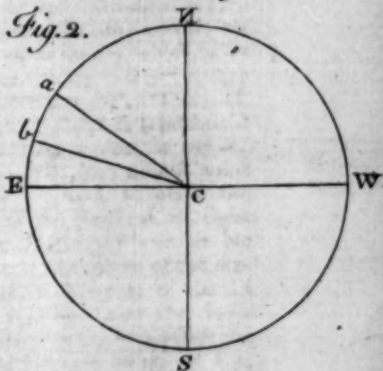


Fig. 1. *Latus Transversum.*



Lee Way.



Level.

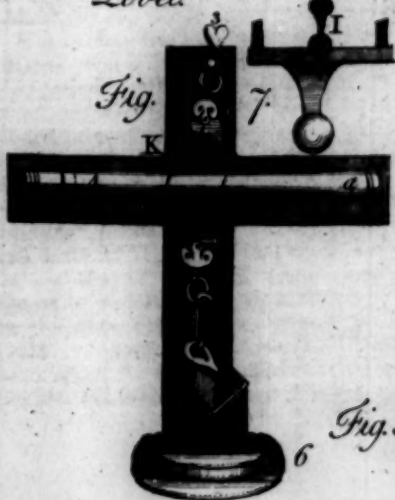


Fig. 5.



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long, at whose ends are fixed two sights exactly perpendicular to the tubes, and of an equal height, having a square hole, formed by two fillets of brass crossing each other at right angles, in the middle of which is drilled a very little hole, through which a point on a level with the instrument is described. The brass tube is fastened on the ruler by means of two screws; one of which, marked 4, serves to raise or depress the tube at pleasure, to bring it to a level. The top of the ball and socket is rivetted to a little ruler, that springs, one end of which is fastened with screws to the great ruler, and the other end has a screw 5, serving to raise or depress the instrument when nearly level.

The following is a more commodious instrument.

Air LEVEL with telescope sights: this level (plate XXVII. fig. 4.) only differs from the last, in that, instead of plain sights, it carries a telescope.

This was invented by Mr. Huygens; which has this advantage, that it may be inverted by turning the rule and telescope half round; and then, if the hair cut the same point that it did before the turn, it is a proof that the operation is just.

It may be observed, that one may add a telescope to any kind of level, by applying it upon a parallel to the base or ruler, when there is occasion to take the level of remote objects.

Dr. Desaguliers contrived an instrument, by which the difference of level of two places, which could not be taken in less than four or five days with the best telescope levels, may be taken in a few hours. The instrument is as follows: to the ball C (fig. 3.) is joined a recurve tube B A, with a very fine bore, and a small bubble at top A, whose upper part is open. It is evident from the make of this instrument, that if it be inclined in carrying, no prejudice will be done to the liquor, which will always be right both in the ball and tube, when the instrument is set upright. If the air at C be so expanded with heat as to drive the liquor to the top of the tube, the cavity A will receive the liquor, which will come down again, and settle at D, or near it, according to the level of the place where the instrument is, as soon as the air at C returns to the same temperament as to heat and cold. To preserve the same degree of heat, when the different observations are made, the machine is fixed in a

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tin vessel V E, filled with water up to *g h*, above the ball, and a very sensible thermometer has also its ball under water, that one may observe the liquor at D, in each experiment, when the thermometer stands at the same height as before. The water is poured out when the instrument is carried, which one may do conveniently by means of the wooden frame, which is set upright by three screws S S S (fig. 4.) and a line and plummet P P. The back part of the wooden frame is represented by fig. 2. where from a piece at top K, hangs the plummet P, over a brass point at N; M m are brackets, to make the upright board K N continue at right angles with the horizontal one at N: Fig. 1. represents a front view of the machine, supposing the fore part of the tin vessel transparent; and here the brass socket of the recurve tube, into which the ball is screwed, has two wings at I I, fixed to the bottom, that the ball may not break the tube by its endeavour to emerge, when the water is poured in as high as *g h*.

After the doctor had contrived this machine, he considered, that as the tube is of a very small bore, if the liquor should rise into the ball at A, in carrying the instrument from one place to another, some of it would adhere to the sides of the ball A, and upon its descent in making the experiment so much might be left behind, that the liquor would not be high enough at D (fig. 3.) to shew the difference of the level; therefore, to prevent that inconveniency, he contrived a blank screw, to shut up the hole at A, as soon as one experiment is made, that in carrying the machine, the air in A may balance that in C, so that the liquor shall not run up and down the tube, whatever degree of heat and cold may act upon the instrument, in going from one place to another. Now because one experiment may be made in the morning, the water may be so cold, that when a second experiment is made at noon, the water cannot be brought to the same degree of cold it had in the morning, therefore, in making the first experiment warm water must be mixed with the cold, and when the water has stood some time before it comes to be as cold as it is likely to be at the warmest part of that day, observe and set down the degree of the thermometer at which the spirit stands, and likewise the degree of the water in the barometer at D; then screw on the cap at A, pour out the water, and

carry

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carry the instrument to the place whose level you would know; then pour in your water, and when the thermometer is come to the same degree as before, open the screw at top, and observe the liquor in the barometer.

The doctor's scale for the barometer is ten inches long, and divided into tenths; so that such an instrument will serve for any heights not exceeding ten feet, each tenth of an inch answering to a foot in height.

The doctor made no allowance for the decrease of density in the air, because he did not propose this machine for measuring mountains (though with a proper allowance for the decreasing density of the air, it will do very well) but for heights that want to be known in gardens, plantations, and the conveyance of water, where an experiment that answers two or three feet in a distance of twenty miles, will render this a very useful instrument.

Foot LEVEL. See the article *Foot Level*.

Artillery Foot LEVEL, in gunnery, is in form of a square, having its two legs or branches of an equal length, at a juncture whereof is a little hole, whence hangs a thread and plummet, playing on a perpendicular line in the middle of a quadrant. It is divided into twice forty-five degrees from the middle. Plate XXVII. fig. 5.

This instrument may be used on other occasions, by placing the ends of its two branches on a plane; for when the thread plays perpendicularly over the middle division of the quadrant, that plane is assuredly level. To use it in gunnery, place the two ends on the piece of artillery, which you may raise to any proposed height, by means of the plummet, whose thread will give the degree above the level.

Carpenter's and Pavior's LEVEL consists of a long ruler, in the middle whereof is fitted, at right angles, another somewhat bigger, at the top of which is fastened a line, which, when it hangs over a fiducial line at right angles with the base, shews that the said base is horizontal. Sometimes this level is all of one board.

Gunner's LEVEL, for levelling cannons and mortars, consists of a triangle brass plate, about four inches high, (fig. 6.) at the bottom of which is a portion of a circle, divided into 45 degrees, which number is sufficient for the

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highest elevation of cannons and mortars, and for giving shot the greatest range: on the center of this segment of a circle is screwed a piece of brass, by means of which it may be fixed or screwed at pleasure; the end of this piece of brass is made so as to serve for a plummet and index, in order to shew the different degrees of elevation of pieces of artillery. This instrument has also a brass foot, to set upon cannons or mortars, so as when those pieces are horizontal, the instrument will be perpendicular. The foot of this instrument is to be placed on the piece to be elevated, in such a manner as that the point of the plummet may fall on the proper degree: this is what they call levelling the piece.

Mason's LEVEL, is composed of three rules, so joined as to form an isosceles-rectangle, somewhat like a Roman A, at the vertex whereof is fastened a thread, from which hangs a plummet, that passes over a fiducial line, marked in the middle of the base, when the thing to which the level is applied is horizontal; but declines from the mark when the thing is lower on one side than on the other.

Plumb or Pendulum LEVEL, that which shews the horizontal lines by means of another line perpendicular to that described by a plummet or pendulum.

Reflecting LEVEL, that made by means of a pretty long surface of water, representing the same object inverted which we see erected by the eye, so that the point where these two objects appear to meet, is a level with the place where the surface of the water is found. This is the invention of M. Mariotte.

There is another reflecting level, consisting of a mirror of steel, or the like, well polished, and placed a little before the object-glass of a telescope, suspended perpendicularly. This mirror must make an angle of 45° with the telescope, in which case the perpendicular line of the said telescope is converted into a horizontal line, which is the same with the line of level. This is the invention of M. Cassini.

Water LEVEL, that which shews the horizontal line by means of a surface of water or other liquor, founded on this principle, that water always places itself level. See the article *Fluid*.

The most simple is made of a long wooden trough, or canal, whose sides are parallel to the base, so that being equally filled with water, its surface shews the line of level.

It is also made with two cups fitted to the two ends of a pipe, three or four feet long, about an inch in diameter, by means whereof the water communicates from the one to the other cup; and this pipe being moveable on its stand by means of a ball and socket, when the two cups become equally full of water, their two surfaces mark the line of level.

This instrument, instead of cups, may also be made with two short cylinders of glass three or four inches long, fastened to each extreme of the pipe with wax or mastic. Into the pipe is poured some common or coloured water, which shews itself through the cylinders, by means whereof the line of level is determined; the height of the water, with respect to the center of the earth, being always the same in both cylinders. This level, tho' very simple, is yet very commodious for levelling small distances.

LEVEL of Mr. Huygens's invention, consists of a telescope *a*, (fig. 7.) in form of a cylinder going through a ferril, in which it is fastened by the middle. This ferril has two flat branches *b b*, one above, and the other below, at the ends whereof are fastened little moving pieces which carry two rings, by one of which the telescope is suspended to an hook at the end of the screw 3, and at *b* the other a pretty heavy weight is suspended, in order to keep the telescope in equilibrio. This weight hangs in the box 5, which is almost filled with linseed-oil, oil of walnuts, or other matter that will not easily coagulate, for more aply settling the balance of the weight and telescope. The instrument carries two telescopes close and very parallel to each other; the eye-glass of the one being against the object-glass of the other, that one may see each way without turning the level. In the focus of the object-glass of each telescope must a little hair be strained horizontally, to be raised and lowered by a little screw. If the tube of the telescope be not level, when suspended, a ferril or ring 4, is put on, to be slid along till it be level. The hook on which the instrument is hung is fixed to a flat wooden cross; at the end of each arm is a hook to keep the telescope steady: to the flat cross is applied another hollow one that serves as a case for the instrument; but the two ends are open, that the telescope may be secured from the weather, and always ready for use. The foot of the instrument is a round brass plate, to which are fastened three brass ferrils,

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moveable by means of joints, wherein are slaves; and on this foot is placed the box.

LEVELLING, the finding a line parallel to the horizon, at one or more stations, and so to determine the height of one place with regard to another.

A truly level surface is a segment of any spherical surface which is concentric to the globe of the earth. A true line of level is an arch of a great circle which is imagined to be described upon a truly level surface.

The apparent level is a straight line drawn tangent to an arch or line of true level. Every point of the apparent level, except the point of contact, is higher than the true level.

Dr. Halley suggests a new method of levelling, which is performed wholly by the barometer, in which the mercury is found to be suspended to so much the less height as the place is farther remote from the center of the earth. Hence it follows, that the different height of the mercury in two places gives the difference of level. Mr. Derham, from some observations at the top and bottom of the Monument in London, found that the mercury fell one tenth of an inch at every eighty-two feet of perpendicular ascent, when the mercury was at thirty inches. Dr. Halley allows of one tenth of an inch for every thirty yards; which, considering how accurately barometers are now made, he thinks this method sufficiently exact to take levels for the conveyance of water, and less liable to errors than the common levels. He also found a difference of three inches eight tenths between the height of the mercury at top and bottom of Snowdon-hill in Wales. For the common occasions of levelling, set a pole upright in a spring, pond, &c. and mark how many feet and inches are above water; then set up another pole of equal length with the other, in the place to which the water is to come. Place the center of a quadrant on the top of this last pole, the plummet hanging free: spy through the sights the top of the pole in the water, and if the thread cuts any degree of the quadrant, the water may be conveyed by a pipe laid in the earth. If you cannot see from one extreme to the other, the operation may be repeated.

LEVER, in mechanics, is any inflexible line, rod, or beam, moveable about or upon a fixed point, called the prop or fulcrum, upon one end of which is the

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weight

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weight to be raised; at the other end is the power applied to raise it, as the hand, &c. Since the momentum of the weight and power are as the quantities of matter in each multiplied by their respective celerities, and the celerities are as the distances from the center of motion, and also as the spaces passed through in a perpendicular direction in the same time, it must follow, that there will be an equilibrium between the weight and power, when they are to each other reciprocally as the distances from the center, or as the celerities of the motions, or as the perpendicular ascent or descent in the same time; and this universally in all mechanical powers whatsoever, which is therefore the fundamental principle of all mechanics.

The lever is of five kinds. The common sort, where the prop is between the weight and the power, but nearest the former. When the prop is at one end, the power applied at the other, and the weight between both. When the prop is at one end, the weight at the other, and the power applied between both. The bended lever, which differs only in form from the first sort. When the prop is placed at an equal distance between the weight and the power; and this is commonly called the balance. See *Balance*.

LEVERET, among sportsmen, denotes a hare in the first year of her age.

* LIVERPOOLE, LIVERPOOLE, or LIRPOOL, a very neat, populous, and flourishing sea-port town, in Lancashire, with a harbour on a bay of St. George's channel, and at the mouth of the river Mersey, which abounds with salmon, cod-fish, flounders, turbot, plaice, and smelts, and at full sea it is more than two miles over. Here is also a ferry. An act of parliament passed in 1738, for enlarging the entrance into its harbour, erecting a pier on the north and south sides, &c. It is governed by a mayor, &c. and sends two members to parliament. The buildings have within the last century greatly increased. The number of burgesses is said to be fifteen hundred. The inhabitants are all merchants, and they carry on an immense trade, the largest in England, next to London and Bristol; having great success, and very large stocks, to all the northern parts of the world, as Hamburg, Norway, and the Baltic; to the British colonies in America; to Guinea and Ireland; also France, Spain, Portugal, and Italy: so that there is no trade but that of Turkey,

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Greenland, and the East Indies, in which they are not concerned. As it imports almost every kind of foreign goods, it has consequently a large inland trade, and shares that to Ireland and Wales with Bristol, namely, it has all the trade of the east and north shores from Dublin to Londonderry; it has a great part of that of North Wales, all the northern counties of England, besides what goods it sends to Cheshire and Staffordshire by the navigation of the rivers Mersey, Weaver, and Dane, even so near the Trent, that its goods are carried by land to Burton. The merchants of Liverpool are also concerned with those of Londonderry in the fishery on the north coast of Ireland. It is the most convenient and most frequented passage to that kingdom: for the Mersey river, or Liverpool water, as the sailors call it, opens to them on the right as soon as they have passed Chester water by sea north; and though it is not, even with the addition of the Weaver, which falls into the same mouth, near so large as the Dee, yet the opening into it, at least as high as Liverpool, is much more commodious; for here ships of any burden may come up with their full lading, and ride just before the town, if not go into their wet dock. The harbour is defended on the south side by a castle, and on the west by a tower on the river Mersey, which is a strong and stately structure; but the town is quite open and unfortified. It has five handsome churches, one of which is a new-built one, besides several meeting-houses. All the new buildings are very genteel, in large, spacious, and clean streets; the houses being of brick, not quite so high as in London, though several which are of hewn stone have been built by the Mores of Blankhall, some of the streets being called from the name of that family. Here is a fine town-house standing on twelve free-stone pillars and arches, and under it is their exchange. The wet dock, with its iron flood-gates, at the east end of the town, is a noble work, performed at a very great expence; for here ships may be laid up or fitted out, being capable of containing eighty or an hundred sail, which are sheltered by the town from the west and north winds, and by the hills from the east winds. The custom-house, a commodious structure, is close by it. From hence is a navigation further up the Mersey, and that for ships of burthen, almost as high as Warrington, and also upon the

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the south channel called the river Weaver, but principally for rock-salt dug out of the earth both in this county and Cheshire, and shipped off here in large quantities, not only for Devonshire, Bristol, and other parts of Somersetshire, but round to London, Colchester, and several other places in the south of England, where it is dissolved in sea-water, then boiled up again into a stronger and finer salt, being as good as that sort called salt upon salt, which the Dutch make from St. Ube's salt, and cure their herrings with it. Here also are shipped off great quantities of Cheshire cheese. The freemen of this town are free at Bristol in England, and at Waterford and Wexford in Ireland. Here is a free school, which is a large and beautiful building, having been formerly a chapel. At the west end of it there was once a statue of St. Nicholas, long since razed, to which the mariners used to make offerings when they went to sea. Here are several almshouses for sailors widows, and other poor old people; a workhouse for employing the poor, which has vastly reduced the poor's rates; and a noble charity-school, where fifty boys and twelve girls are taught, fed, clothed, and lodged, by voluntary contributions. At Liverpool the weekly markets are on Wednesday and Saturday. It lies fourteen miles from Wigan, seventeen from Chester, thirty-eight from Lancaster, and 184 from London. Lat. 53 deg. 22 min. N. Lon. 2 deg. 10 min. W.

LEVIGATION, in pharmacy and chemistry, the reducing hard bodies to an impalpable powder, by grinding them with water on a porphyry or marble.

LEVITE, in a general sense, means all the descendants of Levi, among whom were the Jewish priests themselves, who being descended from Aaron, were likewise of the race of Levi: but it is more particularly used for an order of officers in that church, who were employed in performing the manual service of the temple, such as in fetching wood, water, and other things necessary for the sacrifices; and in singing and playing upon instruments of music.

LEVITICUS, a canonical book of the Old Testament, so called from its containing the laws and regulations relating to the priests, Levites, and sacrifices. The seven first chapters of this book prescribe the ceremonies to be observed in offering burnt sacrifices, meat offerings, peace-offerings, &c. then

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Moses relates in what manner the priests were to be consecrated, and the misfortune of Nadab and Abihu, who offered incense to the Lord with strange fire. Upon this occasion he prescribes some laws concerning the mourning of the priests, and forbids their drinking wine while they were employed in the service of the tabernacle. In the eleventh, twelfth, thirteenth, and fourteenth chapters, he lays down rules for distinguishing clean and unclean beasts, and concerning the leprosy, purifications, &c. appoints the ceremonies to be observed upon the great day of expiation; regulates the degrees of kindred within which persons were allowed or forbidden to marry: prohibits alliances with the Canaanites, and also idolatry, theft, perjury, calumny, &c. In the twenty-third chapter, he takes notice of the principal annual festivals, the passover, pentecost, &c. prescribes what was to be observed in the sabbatical and jubilee years, and concludes with regulations concerning vows and tithes.

LEVITY, in physiology, the privation or want of weight in any body, when compared with another that is heavier than it, in which sense it stands opposed to gravity. See *Gravitation* and *Gravity*.

LEVY, in law, signifies to gather or collect, as to levy money; and to levy a fine of lands, is the passing a fine.

* **LEWES**, a large town of Sussex, with a market on Saturdays, and three fairs, on May 6, for horned cattle; on Whit-Tuesday, for horned cattle and horses; and on October 2, for sheep. It is a very ancient borough by prescription, by the title of constables and inhabitants.

The constables are chosen yearly at a court-leet held by three lords, namely, the duke of Norfolk, the Duke of Dorset, and the lord Abergavenny, each in their turns. This town is well built, and agreeable both for air and prospect; it had formerly a strong castle and a priory. It contains six parish churches, and is esteemed the best borough town in the county. The members of parliament are elected by the inhabitants paying scot and lot; and it carries on a good trade. The assizes for the county of Sussex are sometimes held here. It was noted for a mint in the reign of king Athelstan, and for a bloody battle in the year 1263, between Henry III. and the barons, wherein the king being defeated, was forced to make peace on their terms. In 1711 there was a charity-school opened,

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where twenty boys are taught, clothed, and maintained, as well as supplied with books, at the expence of a private gentleman, and eight more boys were added at the expence of other gentlemen. From a windmill near this town there is a most extensive prospect which reaches as far as Banstead Downs in Surry. It is seated on the river Ouse, five miles north of the English channel, and fifty south of London. Lon. $0^{\circ} 5' E.$ Lat. $50^{\circ} 50' N.$

* **LEYDEN**, a city of the Netherlands, in the province of Holland, built on an ancient channel of the Rhine, which passes through the city, and divides it into several islands, and meets again about the White Gate. It is one of the neatest and pleasantest towns in the Netherlands, and the largest in Holland, except Amsterdam; its streets are clean, wide, and long, divided by several handsome canals. It has eight gates, whereof the White Gate is the most considerable. The city ditches are broad and deep; from the gate called Morcht to that of Amsterdam there is nothing but a rampart made of earth, and covered with turf; but on the other side it is faced with brick, and has several bastions. The esplanade and ditches are adorned with rows of trees, having a rampart on one side, and either meadows or gardens on the other: the canals are planted with rows of trees, and the street called Raepemburgh is one of the finest in Europe. This city contains twenty-three wards, subdivided into ninety lesser parts, thirty islands, twenty-four canals, one hundred and eighty streets, ninety-five bridges, and forty towers on the walls. There are several good churches in this city. They have hospitals here of all sorts, which are kept with a neatness peculiar to this city; that of the orphans only maintains five hundred children. The stadthouse is a very good building, with a very handsome stone front, and in the burgomaster's chamber there is a painting of the last day by Luke of Leyden. But the chief structure in this city is the famous university, founded by the States General in 1573, to make the inhabitants amends for their losses, and hardships they had undergone in a dreadful siege. The scholars are computed at about two thousand. The university is governed by three curators; the rector is chosen yearly out of three who are presented to the states, and on him the scholars only depend. Joining to the schools is a physic garden, where the professor of botany

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reads his lectures: a great number of rarities are to be seen in the galleries, and in the Indian cabinet. There are here made broad and narrow cloths, serges, and camblets, which they transport to all parts of the world. Their gardens likewise yield them considerable profit, their garden-stuff being carried as far as Amsterdam. It is eight miles from Delft, and fourteen north of Rotterdam. Long. $10^{\circ} E.$ Lat. $52^{\circ} 15' N.$

LEXICON, the same with dictionary. It is generally used in speaking of Greek dictionaries.

LIBATION, a religious ceremony among the ancient pagans, which consisted in an effusion of liquors poured on the head of the victims prepared for sacrifice. Libations were also in use among the Hebrews, who poured a tun of wine on the victim after it was killed, and the several pieces of the sacrifice were laid on the altar, ready to be consumed in the flames.

LIBEL, injurious reproaches or accusations against a person, written and published in order to expose him to public contempt, hatred, or ridicule.

LIBEL, in the law of Scotland, implies an indictment.

LIBELLA, or **LIBELLULA**, in the history of insects, a genus of four winged flies, called in English dragon-flies, or adder-flies.

LIBERATE, in law, a writ that lies for the payment of a pension, or annual sum, granted under the great seal, being directed to the treasurer and chamberlains of the exchequer.

LIBERTUS, in Roman antiquity, a person who from being a slave had obtained his freedom.

LIBERTY, *Libertas*, in general, denotes a state of freedom, in contradistinction to slavery. See *Freedom*.

According to Cicero, liberty is the power of living as a man pleases, or without being controlled by another.

In a legal sense, liberty signifies some privilege that is held by charter or prescription.

LIBRA, the balance, in astronomy, one of the twelve signs of the zodiac, the sixth in order. so called, because when the sun enters it the days and nights are equal, as if weighed in a balance.

LIBRA, in Roman antiquity, a pound weight; also a coin, equal in value to twenty denarii.

LIBRARY, an edifice, or apartment destined for the placing of books; or the books themselves lodged therein.

LICENCE,

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LICENCE, in law, an authority given to a person to do some lawful act.

LICENTIA TE, one who has obtained the degree of a licence.

LICHEN, *Cinereus Terrestris*, ash-coloured ground liverwort, in botany, a species of moss, which grows on commons and open heaths, spreads quickly on the ground, and is to be met with at all times of the year, but is supposed to be in its greatest vigour about the end of autumn. This herb is said to be a warm diuretic. It is particularly celebrated as a preservative against the terrible consequences of the bite of a mad dog. An account of the remarkable efficacy, in this intention, of a powder composed of the dry leaves and black pepper, was communicated to the Royal Society by Mr. Dampier, and published in N^o. 237 of the Philosophical Transactions. This powder was afterwards inserted, in the year 1721, into the London Pharmacopœia, at the desire of Dr. Mead, who had large experience of its good effects, and who declares that he had never known it to fail, where it had been used, with the assistance of cold bathing, before the hydrophobia began.

* LICHFIELD, or LITCHFIELD, a city of Staffordshire, which, joined with Coventry, forms one bishoprick. The city stands low, and is divided into two parts by a clear rivulet, over which are two causeways, with sluices upon them. That part on the south side is called the city, and the other the close, as being inclosed within a wall, and a good deep dry trench on all sides, except towards the city, where it is defended by a large marsh formed by the above-mentioned brook. The cathedral, one of the finest in England for elegance and regularity, stands in this close. It was rebuilt by bishop Roger de Clinton in 1148. The west end is richly decorated with the statues of all the kings of Jerusalem from David to the captivity. It suffered much in the civil wars, having been often taken and retaken, and particularly the imagery and carved work on the front were effaced; and it is said that the rude soldiers frequently fired at the cross over the west window, but could not demolish it. These also entirely ruined all the ornaments of the inside, with the brass inscriptions, tombs, &c. but it has been well repaired since the restoration by the care of bishop Hackett, and the generous contributions of several benefactors. It is adorned with three

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such elegant and lofty spires as no church in England can boast of. The choir is paved with alabaster and cannel coal, in imitation of black and white marble. The prebendaries stalls are of excellent workmanship, and re-erected mostly at the charges of the country gentlemen, each stall bearing the arms of its respective benefactor. In the close is the bishop's palace and deanery, as are the houses of the prebendaries in a court on the hill, all very handsome. Here are three other churches, among which that of St. Michael has a church-yard containing six or seven acres of ground. Lichfield was once an archiepiscopal see over the Mercians and East Angles; and the bishopric of Chester is said to have been dismembered from it. It is a town and county, with a jurisdiction of ten or twelve miles round, which circuit the sheriff rides September 8, annually. The town is under the government of two bailiffs, &c. who return two members to parliament. Its weekly markets are on Tuesday and Friday; and its annual fairs, on Shrove-Monday, for cattle, sheep, bacon, cheese, and iron; on May 12, for sheep with other cattle; and on Friday before November 8, for geese and cheese. Here was formerly a castle, long since destroyed. Next to Chester this is the principal city of all the north-west part of England. The houses are straggling in it, though some of them are very handsome; and as it is a thoroughfare to the north-west counties, has several very good inns. The neighbouring parts all about are both pleasant and fruitful. The brook here at about three miles off empties itself into the river Trent. The streets are well paved, and kept very clean, and in the neighbourhood are frequent horse-races. St. Chad, or St. Cedda, formerly one of its bishops, lived an hermetical life by the spring near Stow church, in a little cell; and the Monasticon mentions a shrine given for him, which it says cost 200,000 l. Litchfield gives title of earl to the descendant of Edward Henry Lee, who was created by king Charles II. and is also the birth-place of the ingenious Dr. Samuel Johnson, author of the elaborate English Dictionary, Vanity of Human Wishes, Rambler, Rasselas, London, a poem, and other writings both in prose and verse, well known to the learned world.

LICTORS, *Lictores*, in Roman antiquity, the sergeants or beaules who carried

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ried the fasces before the supreme magistrates: it was also a part of their office to be the public executioners in beheading, scourging, &c.

LIEGE, in law, a term sometimes used for liege-lord, or one who owns no superior; and sometimes for liege-man, or one who owes allegiance to the liege-lord. In our statutes, the king's subjects are sometimes called lieges, or liege-people.

* **LIEGE**, the capital city of the bishopric of the same name, in Germany, is large, populous, wealthy, and remarkable for its antiquity, the magnificence of its public buildings, and the vast number of its churches. It is seated in a valley surrounded by high mountains, separated from each other by pleasant dales, which are watered by three little rivers; there are several hills and valleys within the walls, which are about four miles in circumference, and some islands made by the river Maese, two branches of which run through the town. It is divided into three parts, the city, the island, and the Outer-Maese; it has 16 gates, 17 bridges, and 154 streets; these last are pretty broad, but are neither clean nor regular; and most of the private houses are built of wood; a clear stream generally runs through the middle of the streets, and many of the best houses have fountains in their courts and gardens. Here are upwards of 100 churches; and the cathedral, dedicated to St. Lambert, is a magnificent structure built with stone, and within are a great number of relics: the busto of St. Lambert is in silver, as also the statues of the Virgin Mary and Joseph, as big as life; five great cossers, which hold the relics, are of silver, and St. George on horseback is of massy gold. They have vestments given by pope Gregory, adorned with large pearls, intermixed with diamonds. St. Peter's is the most admirable of the parish churches, being set off with marble ornaments and paintings: all the religious orders have handsome convents and churches. This city is governed by two burgo-masters, twenty counsellors, two perpetual counsellors, and a recorder; besides which they have a chief mayor and two subordinate mayors. The town is seated very conveniently for trade, on account of the river Maese, which is navigable up to this place. This city was bombarded in 1691, and delivered to the French in 1701; it was retaken by the allies in 1702; and the French attempted to get possession of

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it again in 1705; at the approach of the duke of Marlborough, but it was restored to its bishop by the treaty of Baden; it is 12 miles N. E. of Hay; 62 S. W. of Cologne, and 175 N. E. of Paris. The magistrates of Liege pretend that it is an imperial city, or sovereign state; but they have suffered very severely for opposing the authority of their bishop, who is in fact absolute sovereign of the city, as well as the bishopric; he is chosen by the 60 major canons, who are most of them of noble extraction. This bishop is one of the most considerable ecclesiastical princes of Germany, having within his diocese 52 baronies, 18 walled towns, and 400 populous villages, with a revenue of 300,000 ducats per annum, and is able to maintain a body of 8000 men, without oppressing his subjects, who are principally Roman Catholics. Long. 5 28 E. Lat. 5 46 N.

LIENTERY, in medicine, a disorder proceeding from preternatural smoothness of the intestines, in consequence of which what is discharged by stool greatly resembles the aliments, both in colour and substance. The cause of this disorder, according to Fernelius, is not an obstructed or hindered distribution of the aliments, but a weakness of the first concoction, in consequence of which the aliments pass through the intestines unchanged. The principal intention of cure in a lientery, according to Etmuller, is to strengthen and corroborate the stomach; which end is most effectually obtained by rhubarb, preparations of coral and quinces. All the medicines recommended against vomiting, are also proper in this disorder. Waldschmidius informs us, that the most simple and easily prepared stomachics are more beneficial in a lientery, than those of the compound kind. The most proper stomachics, according to that author, are preserved nutmeg, preserved ginger, the white of an egg boiled with vinegar, and wormwood wine prepared with mastick.

LIEUTENANT, an officer who supplies the place, and discharges the office of a superior in his absence. Of these, some are civil, as the lords-lieutenants of kingdoms, and the lords-lieutenants of counties; and others are military, as the lieutenant-general, lieutenant-general of the artillery, lieutenant-colonel, lieutenant of the artillery of the Tower, lieutenant of horse, foot, ships of war, &c.

LORD-LIEUTENANT of Ireland is a viceroy, and has all the state and grandeur

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deur of a king of England, except being served upon the knee. He has the power of making war and peace, of bestowing all the offices under the government, of dubbing knights, and of pardoning all crimes except high treason; he also calls and prorogues the parliament, but no bill can pass without the royal assent. He is assisted in his government by a privy-council; and on his leaving the kingdom, he appoints the lords of the regency, who govern in his absence.

LORDS-LIEUTENANTS of Counties are officers who, upon any invasion or rebellion, have power to raise the militia, and to give commissions to colonels and other officers, to arm and form them into regiments, troops, and companies. Under the lords-lieutenants are deputy-lieutenants, who have the same power; these are chosen by the lords-lieutenants, out of the principal gentlemen of each county, and presented to the king for his approbation.

LIEUTENANT-GENERAL, an officer next in rank to the general; in battle, he commands one of the wings; in a march, a detachment, or a flying camp; also a quarter, at a siege, or one of the attacks when it is his day of duty.

LIEUTENANT of a ship of war, the officer next in command to the captain, and who governs the ship in his absence. In the British navy an officer must have served six years at sea, two of which he must have been mate or midshipman in some of the king's ships, before he can be appointed a lieutenant; he must also pass an examination. The number of lieutenants appointed to a ship is always in proportion to her rate, a first rate having six, and a sixth rate only one. In an engagement the station of the lieutenants is to superintend the manœuvre of the great guns, and observe that they are properly supplied with powder and shot, &c. The lieutenant ranks with captains of horse and foot. The half-pay of a lieutenant of the navy, which was before only two shillings per day, has lately been raised to three shillings per day.

LIFE, *Vita*, in general, a kind of active operative existence, and conceived to consist in motion.

LIFE is used in a more particular sense to signify the duration of an animal's being; or the space of time which passes between its birth and death.

LIGAMENT, in anatomy, a strong compact substance, serving to join two bones together. A ligament is more flexi-

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ble than a cartilage, not easily ruptured or torn, and does not yield, or at least very little, when pulled.

LIGATURE, in surgery, a cord, band, or string; or the binding any part of the body with a cord, band, fillet, &c. whether of leather, linen, &c. Ligatures are used to extend and replace bones that are broken or dislocated; to tie the patients down in lithotomy and amputations; to tie upon the veins in phlebotomy, or the arteries in amputations, or in large wounds; to secure the splints that are applied to fractures; to tie up the processes of the peritonæum, with the spermatic vessels in castration; and lastly, in taking off warts or other excrescences by ligature.

LIGHT, *Lux*, in philosophy, certain inconceivable small particles of matter, of different magnitudes, which are emitted or reflected from every point in the surface of a luminous body in right lines, and in all directions, with an unparalleled velocity, and whose power and intensity decrease as the squares of the distances increase. That light is a material substance, and what we properly call body, is not to be doubted; because we find it something that has motion, or is propagated in time; something that acts upon our bodies, and produces great alterations and changes in their natures and forms. It is something that bodies act upon, by reflecting, infecting, and refracting it on their surfaces, and in their pores: and it would appear to have weight, and all other sensible qualities of common matter, were it not that the smallness of its quantity renders them entirely imperceptible to us. Nor are we to consider light only as a body, but as the most active principle or most general agent in nature; and it is, perhaps, the true *primum mobile*, or the spring of motion and action in all other bodies. Were the particles of light to be annihilated, we should see no marks or footsteps of fire or heat remaining, and therefore no power of motion in bodies; but all things would put on the appearance of lifeless inert matter, rigid and inflexible, as it would be absolutely cold and dark. The divine wisdom and providence appear, perhaps, in nothing so remarkably as in the extreme subtilty of the particles of light: without this qualification it could not have pervaded the pores of bodies, and so we could have had none of those which we call diaphanous or transparent substances, and every thing but the surface of a body would

would have been concealed from the sight of mankind. Again, the velocity of a body is always as the quantity of matter inversely; and therefore, the smaller the body, the greater velocity it is susceptible of from the same force; whence it comes to pass that light is thus qualified to be transmitted through immense distances in a small and insensible part of time; which thing was quite necessary, according to the present frame and state of nature. But lastly, it was absolutely necessary that the particles of light should be so exceeding small, that, when compounded with its velocity, it should produce no sensible force, as it must otherwise have done, and which, therefore, could not have been borne by the tender and delicate texture of the several parts of vegetable and animal bodies. To give an example: the velocity of a particle of light is found to be at the rate of 897600000 feet per second: suppose its matter to be but one million part of a grain, then its force to strike an object would be as $\frac{897600000}{1000000} = 897,6$ feet per second for one grain; or it would strike with the same force that one grain weight would do falling from half the height, viz. through 448,8 feet; which we should find to be very great, was the experiment to be made on the sensible coats of the eye. Since the weight of bodies is proportional to the quantity of matter, it follows, that, where the latter is diminished indefinitely, the former will be so too; therefore, the weight of light must be insensible to ever so great a quantity of it. Dr. Boerhaave caused a globe of iron, twelve inches in diameter, to be heated red-hot, and suspended at the end of a very exact balance, and counterpoised by weights at the other end very nicely, and thus let it hang till all the particles of heat or light were escaped, when he found the equilibrium of the balance no ways altered; which plainly proves the above thesis. See the article *Fire*.

That the particles of light have not only magnitude, but that in different degrees also, is another, and perhaps the most subtle, discovery of the Newtonian philosophy. The comparative terms of greater and lesser are now as applicable to the particles of light as to any other bodies. This is absolutely proved by the different refrangibility they are found to have in passing through a prismatic figure of glass or water; for the power of the prism detains the issuing particle, and

draws it a little towards the surface; and since this power is the same, it would have the same effect on all the particles of light, if they were all of an equal magnitude, because they have all an equal velocity. But since this effect is different among the particles, some being detained and drawn aside to a greater distance than others, it follows, they must be less in magnitude, to become more subject to the influence of the attracting surface; in like manner as the electric effluvia will act upon and agitate very small and light bodies, much sooner and more easily than they can move those which are larger. But of this more when we come to speak of the manner in which this power acts in refracting the rays of light. See *Refraction*.

If light were not reflected from every point of the surface of a body in all directions every way, there might be assigned a point of space where a ray of light, from such a point in the surface, does not come; and there the said point of the surface could not be visible; but because the eye can find no point of space in all the visible hemisphere respecting that point, but where it is visible; therefore a ray of light is reflected from that point to every part of space, from whence a right line to that point can be drawn.

That the rays of light proceed in a right-lined direction, is evident from hence, that whatever the figure of the body be, if it be held perpendicular to the rays of light, it will always cast a shadow of the same figure against a parallel plane. Thus a circle will produce a circular shadow, a triangle a triangular one, and so on. Which plainly shews that the rays of light pass by the extremities of these bodies in right-lined directions, excepting these only which pass contiguous to the edges of the body; for they will be a little inflected, which will cause the extremity of the shadow to be not so distinct and well defined as it otherwise would be.

As all the other affections of light, so that of its velocity was utterly unknown to all the ancient, and most of the modern philosophers, who, before the time of Mr. Romer, were of opinion that the motion of light was instantaneous, or that it was propagated through immense spaces in an instant. But Mr. Romer, and other philosophers, about this time, making frequent observations on the eclipses of Jupiter's moons, found that the velocity of light is to that of a cannon-ball,

897,600,000 to 578, or as 1,550,000 to 1.

For the properties of reflected and refracted light, see the articles *Reflection* and *Refraction*.

LIGHT is also used to denote the disposition of objects, with regard to the receiving of light; thus, the doors, windows, &c. of houses, are called lights.

For the lights and shades of paintings, &c. see *Claro-Obscuro*.

LIGHTER, a sort of vessel or large boat employed in harbours or rivers, to bring goods to and from a ship in the act of lading and delivering the cargo.

LIGHT-HOUSE, among sailors, a little house erected on a cape, hill, or promontory, near the sea-coast, for the direction of ships which are passing that way: for this purpose it is furnished with great lights at the top, and has always somebody to watch them. As the lights may be seen at a great distance, they are very serviceable in guiding ships which are at a loss to know where they are.

LIGHTNING, in physiology, the bursting of fire from a cloud. From Dr. Franklin's experiments, it appears, that lightning is only electrical fire drawn off from the clouds; and, in effect, this electricity has been collected during thunder in iron bars, or on tin tubes, in many parts of Europe. See *Electricity*.

Thunder then, or lightning, is in the hand of nature, what electricity is in ours; the wonders which we now exhibit at pleasure, are only little imitations of those great effects which frighten us. A cloud prepared by the action of winds, by heat, by a mixture of exhalations, &c. is the electrified body; and watery clouds, or terrestrial matter, the non-electrics which excite it. See *Thunder*.

LIGULATED, among botanists, an appellation given to such floscules as have a straight end turned downwards, with three indentures, but not divided into segments.

LIGUSTICUM, lovage, in botany, a genus of plants.

LIGUSTRUM, privet, in botany.

LILAC, in botany, a genus of trees, otherwise called *Syringa*. See *Syringa*.

LILIACEOUS, an appellation given to such flowers as resemble that of the lily.

LILIO-NARCISSUS, or **AMARYLLIS**, in botany, a genus of plants.

LILIUM CONVALLIUM, lily of the valley.

* **LILLO** (**GEORGE**) an excellent dramatic writer, was born near Moorgate, in London, in 1693, where he pursued his business of a jeweller many years, with the fairest reputation. He was strongly attached to the Muses, and all his compositions tend to the promotion of virtue, morality, and religion. Mr. Lillo, in pursuing his aim, made a happy choice of his subject. He does not introduce kings and heroes on the stage; yet by exhibiting tragic scenes in common and domestic life, and representing the ruin of private families, by lust, avarice, and other vices, he raises the passions to an equal height, and exacts a tribute of tears from the audience. It is said, that when his *George Barnwell* first came upon the stage, many of the critics attended its first representation with the most unfavourable impressions, and the story being founded on an old ballad, they brought it with them, intending to make pleasant remarks and ludicrous comparisons between the ancient ditty, and the modern drama; but the merit of the play soon got the better of their contempt, and presented them scenes written so truly to the heart, that they dropped their ballads, and took out their handkerchiefs. Mr. Lillo wrote four other tragedies, *The Christian Hero*; *Elmerick*; *Fatal Curiosity*; and *Arden of Feversham*; and dying in the year 1739, left behind him a most excellent character.

LILY, *lilium*, in botany, the name of a large genus of plants. All sorts of lilies and martagons are propagated by sowing their seeds; and if the seeds are carefully saved from good flowers, the martagons very frequently afford very beautiful varieties. The roots of the white lily are emollient, maturating, and greatly suppurative. They are used externally in cataplasms for these purposes with success. The common form of applying them is boiled and bruised; but some prefer the roasting them till tender, and then beating them to a paste with oil, in which form they are said to be excellent against burns. Gerard recommends them internally in dropries.

* **LIMA**, the capital of the audience of Lima, and the whole empire of Peru in North America, is peopled with above 15,000 Creoles, or Spaniards, and about 40,000 negroes. The city is surrounded with walls, and defended with many bastions and ramparts, eight yards in height, but they have few cannon, and therefore could make but a poor defence. The streets are handsome, and as straight as

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a line, but the houses are only one story high, on account of the earthquakes, and are covered only with mats or reeds on the top, which is not inconvenient here, because it never rains. Some have long galleries in the front, and are handsomely adorned on the inside. Some of the houses are covered with a fine sort of tissue, or curious cotton cloth; and they plant trees about their houses to keep off the heat of the sun. What these houses want in height is made up in length and breadth, there being often ten or twelve large apartments. The royal square of Lima is very handsome, in the middle of which is a fountain of bronze, and on the east and west sides are divers superb public buildings. The river which crosses Lima is divided into small channels, which enter into many of the houses, and is of great utility to the inhabitants to water their gardens, and other purposes. The churches and convents of Lima are full of riches, and extremely magnificent, inasmuch that religion is as it were stifled under the weight of gold and silver, and its humility is quite lost. Many of their saints are of massy gold set off with precious stones. The inhabitants of Lima are generally the richest in all Peru, and value themselves upon being the best Christians in the world. The ecclesiastics solemnize all the festivals of the church with extraordinary expence, and ridiculous representations, in masquerades, fire-works, and processions, at which time the saints shine in gold, silver, and precious stones: in short, there is such a mixture of seeming devotion and real debauchery among all the inhabitants, not excepting the priests, monks, and nuns, that such another place can hardly be found in the world: and yet with all this they are extremely credulous, and have a strong faith in witchcraft and charms. The convents of the monks and nuns are so numerous, that they take up a fourth part of the city. This is the only country between the tropics where grapes come to perfection, and where they make good wine, their vineyards and fields being watered with rivolets, which descend from the mountains called the Andes, which are the highest in the world. In short, this city would be a perfect paradise if it were not for the earthquakes, for the adjacent country yields plenty of corn, wine, oil, sugar, flax, and fruits. The heat of the climate is constantly moderated with cool sea-breezes, or the land-winds from the mountains. This city has been several

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times almost overturned by earthquakes, as in the years 1586, 1678, and 1687: but the most terrible of all happened on the 16th of October 1746, at which time it was almost destroyed. It is seated six miles E. of the Pacific Ocean, and of the port-town of Calao, in a fruitful plain, 350 miles W. of Cusco, on the river Lima. Long. 75 52 W. Lat. 12 2 S.

LIMB, in a general sense, denotes the border or edge of a thing: thus we say the limb of a quadrant, of the sun, of a leaf, &c.

LIMB, in anatomy, an appellation given to the extremities of the body, as the arms and legs. See *Arm* and *Leg*.

LIME, *Calx*, a soft, friable substance, obtained by calcining or burning stones, shells, and the like. There are so many species of stone capable of being burnt into lime, and so many that in the different parts of the world are really put to that use, that it would be difficult to fix any particular idea to the term lime-stone; but we are to understand by it in general, any stone that, upon a proper degree of heat, continued a sufficient time, becomes a white calx, which will make a great ebullition and noise on being thrown into water, and will, in fine, fall into a loose white powder at the bottom of that liquor, after having very strongly impregnated it with its soluble particles. The most common kind of lime-stone is a greyish or bluish stone, found in loose masses, and often veined with red: marble, alabaster, and all the stones that have spar for their basis, may also come under the general denomination of lime-stone, since they all burn into lime. In general, every stone, of whatever kind or colour, that will ferment with aqua-fortis, will also burn into lime; and it is of no consequence to the medicinal use of that calx, whether it be made of the one or the other of these stones. What lime we have in London is made of chalk, which is weaker than that made of stone; but it is otherwise the same. The best lime is that made of the hardest stone: it is not only used by architects, builders, plasterers, dyers, sugar-refiners, tanners, and many other mechanics, but is an excellent manure for land, where it is sandy, or a mixed gravel or clay soil. In many places it is carried out and laid in heaps, allowing a bushel to a pole square, or 160 bushels to an acre. The best method of ordering it is to mix it with dung, or with mud drawn from the bottom of rivers; this makes an excellent

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lent mixture, especially where the soil is sandy; and in Westmoreland they produce fine crops of barley from their sandy lands, by manuring them with lime and cow dung mixed together. The nature of lime on land is like that of chalk, it works downwards, as the farmers express it; and therefore it is best to treat it in the same manner, laying it fallow the year before it is to be ploughed up. It is observed that if the lime be carried hot out of the kiln, and laid upon the land to cool, it does much better than in any other way. The improvement it makes upon land is owing chiefly to its heat, and the salt it contains. It is in much the same manner that coal-ashes and the foot of coal becomes useful upon the like kind of lands; but the farmers always find that a mixture of good earth and lime, that has laid a considerable time together, is better for this purpose than the fresh lime alone. Lime is also of great utility in medicine, for which use it is to be chosen in clean, light, and hard pieces, but not stony, such as will not easily crumble to pieces between the fingers, and yet will readily break when thrown into water. The best lime in the world, on being long exposed to a damp air, will moulder into a powder, and lose all its medicinal virtues. Quick-lime is burning and corrosive, and is never given internally; but it is sometimes used in external applications, as made into a paste with orpiment, soap, &c. and used as a depilatory. The calx lota, i. e. lime washed with water, is no longer a corrosive, but a powerful desiccative; and lime-water is of great service internally in all cutaneous eruptions, in the cure of obstinate ulcers, and for diseases of the lungs: for this purpose it is generally to be continued a considerable time. The preparations of lime in use in the shops are, the simple lime-water; the less compound lime-water; the more compound lime-water; and several kinds of caustics. Simple lime-water is made in the following manner: Put a pound of quick-lime into a large earthen pan; pour upon it, by a little at a time, a gallon and a half of water; after the ebullition is thoroughly over, let the liquor stand to settle, and then pour it clear off, and filter it for use. This is principally intended for washing old ulcers, and other external purposes: when it is to be taken internally, the following additions are made to it, to take off its flavour, or to add to its virtues. Take of liquorice-root

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an ounce; of sassafras-bark, half an ounce; simple lime-water, three quarts; let the whole infuse together for two days without heat, then filter it for use. This last preparation is called the less compound lime-water. The more compound lime-water is made thus: Take raspings of guaiacum, half a pound; liquorice-root, an ounce; sassafras-bark, half an ounce; of coriander-seed, three drams; of lime-water, three quarts; let the whole stand together two days without heat, and then filter it off for use.

It has been found by several late experiments made by Dr. Alston, that lime-water is an excellent remedy for the stone; and that it has also been given with extraordinary success in acute fevers.

Sponius says, that when drank with milk or whey, it performs wonderful effects in internal ulcers, diarrhœas, and the dysentery.

Lime-water, on being mixed with linseed-oil, or the oil of olives, and well shaken, acquires the consistence of a balsam, which is of singular service when applied externally in fresh burns, and also conduces to stop inflammations. It may also be impregnated with copper, by standing in a brazen basin: by which means it assumes a beautiful sapphire colour, and proves an excellent remedy against pustules, ulcers, scabies, and itching of the eyes; and this last preparation, mixed with a little sal-ammoniac, is recommended against all humours, films, and other blemishes of the eyes, and is said to be very efficacious when the eyes are hurt by the small-pox; and there is no remedy more effectual for cancerous ulcers.

LIME-TREE, the English name of the tilia. See *Tilia*.

LIMITS of *Equations*, in algebra, a method of discovering the limits of the root of equations, by which their solutions are much facilitated.

LIMITS of a *Planet*, its excursion from the ecliptic, or, which is the same thing, the points of its greatest latitude.

LIMITATION, in law, a certain space of time allowed for bringing actions in.

LIMITATION of *Estate*, is the length of time an estate is to continue in the possession of a person or family.

LIMITED PROBLEM, a problem that admits but of one solution, as to make a circle pass through three given points, not lying in the same right line.

LIMNING, the art of painting in

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water colours, in contradistinction to painting, which is done in oil-colours.

LIMPET, the English name of a shell-fish, called by authors patella.

* LINCOLN, a city of Lincolnshire, was formerly called Lindum, and is as remarkable as it is ancient. William the Conqueror built here a large strong castle for its defence, and much about the same time the bishop Remigius translated his see hither from Dorchester, and founded the magnificent cathedral, wherein is a brazen tomb of queen Eleanor, wife to Edward I. who died at Hureby, in this county, and another of Catharine Swinford, wife to John of Gaunt, duke of Lancaster. This building may be seen fifty miles northward and thirty southward, and is one of the largest in England. This city is governed by a mayor, two sheriffs, a recorder, twelve aldermen, four chamberlains, as many coroners, about forty common-council-men, a town-clerk, a sword-bearer, and two serjeants at mace. There is a very plentiful market here on Tuesday, for all manner of provisions, especially fish and fowl, and on Friday for goods, with five fairs held on the second Tuesday after April 12th, July 5th, the first Wednesday after September 12, and November 12th, for horses, cattle, and sheep. This city abounded formerly with monasteries, and other religious houses. It has a bold and noble situation upon a high hill, below which, and to the westward of the city, the river falls into a great pool, called Swan-pool, from the multitude of its swans. This city is mentioned by Leland to have had fifty-two parish churches, though it has now but thirteen, besides the cathedral, or minster, which is one of the largest in England. It is a magnificent structure, and has two great gate-houses to it from the west. The lower part of the front and one of the two towers were built by Remigius; but bishop Alexander erected the body of the cathedral and the two other towers. In this structure is the famous bell called Tom of Lincoln, which is near five tons in weight, almost twenty-three feet in circumference, and will hold four hundred and twenty-four gallons, ale measure. Here are also in this church two catherine-wheel windows, which are remarkably fine for the workmanship and painted glass. Here are also a chapter-house, cloister, and library, that are much admired. Here are charity-schools, where one hundred and twenty poor children are taught by the

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widows of clergyman. The city is a county of itself, with a jurisdiction twenty miles round, and in the centre of the ruined old castle there is a hall for holding the assizes. It is fifty-two miles north of Peterborough, thirty-two miles north-east-by-east of Nottingham, seventy-two miles south of York, and one hundred and thirty-one north of London. Long. $0^{\circ} 27'$ W. Lat. $53^{\circ} 15'$ N.

* LINCOLNSHIRE, a maritime county, about sixty miles long, and in some places thirty broad, bounded on the east by the German ocean, on the west by Nottinghamshire, on the south by Northamptonshire, and on the north by Yorkshire, from which it is parted by the Humber. Its principal rivers are the Welland, the Witham, the Trent, the Dun, and the Ankam. It contains thirty hundreds, one city, thirty-nine market-towns, six hundred and thirty parishes, two castles, and three parks. In the times of the Britons and Normans it was part of the country of the Coritani, and under the Saxons it was part of the large kingdom of Mercia. This county is in some seasons stocked with various kinds of fowl, and in a prodigious number, such as teal, quails, woodcocks, pheasants, partridges, peewits, godwits, knots, and dottrels.

LINE, *Linea*, in geometry, a quantity extended in length only, without any breadth or thickness. It is formed by the flux or motion of a point.

There are two kinds of lines, viz. right lines and curve lines. If the point A, (plate XXIX. fig. 1.) moves towards B; by its motion, it describes a line, and this, if the point go the nearest way towards B, will be a right or straight line, whose distinction therefore is the nearest or shortest distance between any two points; or a line, all whose points tend the same way. If the point go any way about, as in one of the lines A B C, or A c B, it will trace out either a crooked line, as the upper A c B, or else two more straight ones, as in the lower A C B. Right lines are all of the same species, but curves are of an infinite number of different species. We may conceive as many as there may be different ratios between their ordinates and abscisses. See the articles *Absciss* and *Ordinate*.

Curve lines are usually divided into geometrical and mechanical; the former are those which may be found exactly in all their points; the latter are those, some or all of whose points are not to be found precisely, but only tentatively or nearly.

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Curve lines are also divided into the first order, second order, third order, &c.

Lines considered as to their positions, are either parallel, perpendicular, or oblique, the construction and properties whereof see under *Parallel*, &c.

Euclid's second book treats mostly of lines, and of the effects of their being divided and again multiplied into one another.

LINE, in geography, the same with equator. See the article *Equator*.

LINES, in astronomy, are, 1. Fiducial line, the line or ruler which passes through the middle of an astrolabe, or the like instrument, and on which the sights are fitted, otherwise called alhidade, index, dioptra, and mediclinium. See the article *Astrolabe*. 2. The horizontal line. 3. Isochronal line. 4. Meridian line. 5. Line of the nodes. See the articles *Horizontal*, *Isochronal*, *Meridian*, and *Nodes*.

Lines, in perspective, are, 1. Geometrical line, which is a right line drawn in any manner on the geometrical plane, 2. Terrestrial line, or fundamental line, is a right line wherein the geometrical plane, and that of the picture or draught intersect one another: such is the line *NI*, (plate XXIX. fig. 2.) formed by the intersection of the geometrical plane *LM*, and the perspective plane *HK*. 3. Line of the front, is any right line parallel to the terrestrial line. 4. Vertical line, the common section of the vertical and of the draught. 5. Visual line, the line or ray imagined to pass from the object to the eye. 6. Line of station, according to some writers, is the common section of the vertical and geometrical planes. Others, as Lamy, mean by it the perpendicular height of the eye above the geometrical plane. Others, a line on that plane, and perpendicular to the line expressing the height of the eye. 7. Objective line, the line of an object from whence the appearance is sought for in the draught or picture.

LINES, in dialling, are, 1. Horizontal line, the common section of the horizon and the dial-plane. See *Dial*. 2. Hourly lines, or hour lines, the common intersections of the hour circles of the sphere, with the plane of the dial. 3. Substylar line, that line on which the style or cock of a dial is duly erected, and the representation of such an hour-circle as is perpendicular to the plane of that dial. 4. Equinoctial line, the common

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intersection of the equinoctial and plane of the dial.

LINE of Direction, in mechanics, that wherein a body actually moves, or would move, if it were not hindered. It also denotes the line that passes through the center of gravity of the heavy body to the center of the earth, which must also pass through the fulcrum, or support of the heavy body, without which it would fall.

LINE of Gravitation, of any heavy body, a line drawn through its center of gravity, and according to which it tends downwards.

LINES on the plain Scale, the line of chords, line of lines, line of tangents, line of secants, line of semitangents, line of leagues; the construction and application of which see under the words *Scale*, *Sailing*, &c.

LINES on Gunter's Scale, are the line of numbers, line of artificial lines, line of artificial tangents, line of artificial versed sines of rhumbs, line of artificial tangents of the meridian line, and line of equal parts.

LINES of the Sector, are the line of equal parts, or line of lines, line of tangents, line of secants, line of polygons, line of numbers, line of hours, line of latitudes, line of meridians, line of metals, line of solids, line of planes; for the construction and use of which, see *Sector*.

LINES, in fortification, are those of approach, capital, defence, circumvallation, contravallation, of the base, &c.

To **LINE a Work**, signifies to strengthen a rampart with a firm wall; or to encompass a parapet or moat with good turf, &c.

LINE, in the art of war, is understood of the disposition of an army, ranged in order of battle, with the front extended as far as may be, that it may not be flanked.

LINE of Battle, in the marine, the array in which a fleet or squadron of ships of war is formed to engage with an enemy. In this manœuvre the ships are drawn up about one hundred fathoms distant, a-head of each other, the admiral being in the center, whose chief judgment is to form it in a proper disposition and strength throughout from the van to the rear; in doing which, particular care must be had to make the center strong; for if that is forced or broke through, the battle is looked upon as lost. Here it is to be observed, that in a sea-action

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action the center is made the strongest; whereas in a land-fight it is the weakest; and the wings of an army are the strongest, lest the enemy, by forcing a wing, should have the advantage of flanking, and consequently putting the line in confusion; for the same reason also, the van and rear of a fleet is not put into disorder, because care is taken to make them proportionally strong to resist the enemy; therefore the weakest part of the line will be in the quarters, as supported each way from the center throughout. The line being thus formed, there ought to be a corps-de-reserve, as many as may be thought necessary, if they can be dispensed with. But first, the line must stretch out the length of the enemy's, if possible, or else they will have the advantage, and by tacking and doubling upon your line, put the van and rear into confusion. It is a maxim in naval discipline that a commanding flag-ship should never go out of the way for any ship whatever, unless that ship should be disabled, or that a sudden shift of wind takes her unexpectedly. The reason is self-evident: if the admiral gives way for one, or backs and fills for another's fancy or misconduct, there would be no end to such negligence or oversight; therefore the commanding flag-ship expects that every ship in his fleet will observe and take her motions from him and his seconds, whose distance from the admiral should be a standard for every other ship to follow in that from each other, as near as possible, except when her signal is made to back or fill, or make more or less sail. The seconds to the commanding flag-ship are particularly to regard her, to move as she does, whether the other ships do or not, or cannot do; for they are called seconds to guard and attend the admiral's ship. It is the duty of every officer, as soon as the signal is displayed for the line, to crowd, if possible, into his station, and not lie, through indolence or negligence, braced to or a-back, but make sail to windward, or bear away to leeward, in order to form the line immediately, and then each leading ship to mind her tack as the wind is, to lead and give room. The commanding flag-officer, when his ships are arranged into a line, observes the strength of the enemy's line throughout, and acts accordingly, making more or less sail, or what motion he might think most to his advantage. He is not to take his motion from his leading ship, but upon some particular

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occasion, signal, notice, or message sent to him.

In a line of battle the weathermost fleet, or that which has the weather-gage, in the sea-language, is generally allowed to have the advantage, although there are several arguments on the other hand in favour of the lee-side. We shall endeavour to state the mutual advantages.

1. The weather-gage is soonest clear of smoke; and of course that line can better observe the signals which are spread than the ships to leeward can, which must have the continuance of both its own and of the enemy longer.

2. If the weather-ships are more in number than the enemy's fleet, they can detach some from their squadron, which bearing down upon the rear of the enemy, must infallibly throw them into disorder.

3. The fire-ships of the weather-line can, when they are ordered, more easily bear down upon the enemy, than those of the lee can ply to windward, which can never be done against a line in action; but the weather fire-ships can bear down against all the resistance that can be made by the enemy.

Advantages of the lee-line.— 1. If one, two, or more of the ships to windward should be disabled, they must inevitably drive to leeward, and become a prey to the enemy.

2. The ships of the lee-line can more readily bear away before the wind, and have their places supplied by ships from the corps-de-reserve, in case of being disabled or meeting with any disaster.

3. The line to leeward can keep their ports longer open in a strong wind with a high sea, when those to windward, in all probability, may be obliged to shut the ports of their lower tier of guns, to prevent the water from rushing in between decks, which may be attended with the most fatal consequences.

4. The lee-line can more easily observe the men on the decks of the ships to windward, as they heel, and when the smoke does not intercept their sight: at which time the marines and top-men may easily take aim at, and destroy them with muskets or carabines.

LINE A-BREAST, an arrangement in which the whole squadron advances uniformly with all the ships parallel to each other; so that the length of each ship forms a right line with the line a-breast. See *Division, Squadron, and Naval Engagement*.

LINE, in genealogy, a series or succession

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cession of relations in various degrees, all descending from the same common father. Direct line, is that which goes from father to son; being the order of ascendants and descendants.

Collateral line is the order of those who descend from some common father, related to the former, but out of the line of ascendants and descendants: in this are placed uncles, aunts, cousins, nephews, &c.

LINE also denotes a French measure, containing the twelfth part of an inch, or the hundred and forty-fourth part of a foot.

LINES, in music, the names of those strokes drawn horizontally on a piece of paper, on and between which the characters and notes of music are disposed; their number is commonly five; when another is added, for one, two, or more notes, it is called a ledger-line.

LINES, in heraldry, the figures used in armories, to divide the shield into different parts, and to compose different figures. These lines, according to their different forms and names, give denomination to the pieces or figures which they form, except the straight or plain lines.

LINEAMENT, among painters, implies the out-lines of a face.

LINEN, in commerce, a well known kind of cloth, chiefly made of flax. See *Flax*.

LINIMENT, *Linimentum*, in pharmacy, a composition somewhat thinner than an unguent, and thicker than an oil, used for anointing the body in various intentions.

LINNET, *Linaria*, in ornithology, a bird of the size of a goldfinch; the head is small and flattened; the eyes are small, and hazel; the beak is conic, very small, and sharp at the point; the head, neck, and back are variegated with a bright brown and white; the breast and belly are pale, but in the male, especially in the summer, there is a redness on the top of the head and all over the breast. This is a singing bird, and sometimes has young ones four times a year, especially if they are taken from the dam before they are able to fly, which may be done four days after they are hatched.

LINSEED, the seed of the plant *linum*. Linseed bruised and steeped in water, gives it very soon a thick mucilaginous nature, and communicates much of its emollient virtues to it. It is anodyne, attemperating, and of great service in suppressions

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of urine from inflammation and heat; it envelops the acid salts of the urine, and prevents their vellicating and wounding the tender parts; and in some measure supplies the mucus of the bladder, when abraded and worn off. It is to be given in decoction, or infusion, on these occasions: the infusion is not to be made too thick or mucilaginous, because in that case it loads the stomach, and breeds flatulences in the intestines. A slight infusion of linseed, by way of tea, is recommended by many as an excellent pectoral; and the seed is a common and very good ingredient in clysters. Externally, this seed, ground to powder, is an excellent emollient; as is also the strong mucilage, made by boiling the seeds a long time: the oil drawn from it by expression is of great service in coughs, pleurisies, and many other cases.

LINSTOCK, in the military art, a wooden staff, about three feet long, upon one end of which is a piece of iron, which divides in two, turning from one another, having each a place to receive the match, and a screw to keep it fast: the other end is pointed, and shod with iron, to stick in the ground. It is used, by gunners, to fire the guns.

LINT, *Linum*, the flax of which linen is made.

In surgery, the term lint denotes the scrapings of linen which is used in dressing wounds, and is made up in various forms, as tents, dossils, pledgets, &c.

LINTEL, in architecture, a piece of timber that lies horizontally over doorposts and window-jambs, as well to bear the thickness of the wall over it, as to bind the sides of the wall together.

LION, *Leo*, in zoology, the strongest and fiercest of all quadrupeds.

The head of the lion appears very large in proportion to its body, and is the most fleshy of the heads of all the known animals. Its jaw-bones also are remarkably large. The breast also appears very large, but this is only owing to the great quantity of long hair that covers it, for the sternum is smaller than that of most animals of the same size. The tail, which is very long, appears also of the same thickness all the way, but this is wholly owing to the growth of the hair. The tail itself is largest at the base, and then goes taper to the point; but the hair, being very short near its base, and continuing to grow longer all the way, as that decreases in thickness, is so exactly proportioned to this growth, that it always gives

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gives the whole tail this regular appearance. The long hair that grows about the neck and breast, and makes what is called the mane of the lion, only differs from the hair of the rest of the body in length, having no greater thickness, or rigidity, like that of the manes of other animals. The claws of the lion have no cases, as Pliny pretends they have, for the animal to withdraw them into in walking; but Plutarch, Solinus, and some others, are much more in the right, in saying that the lion draws them up backwards when he walks, and places them closely among the articulations of the toes. It is certain that the last joint but one of every toe in this creature has a peculiarly easy joint for motion, and by means of this the last joint, with the claw that is affixed to it, are very readily drawn up, and hid upon the foot, and placed wholly out of the way of being hurt in walking. The lion has fourteen teeth in each jaw, four incisores, four canine, and six molares. The incisores are small; the canine are unequal in size, two being very large, and two very small; the large ones are an inch and a half long, and are the only ones the ancients allowed to be canine teeth. The molares also are irregular in size, the anterior ones being very small, the others large, and terminated by three or four points, forming a sort of flower-de-luce. Aristotle, Ælian, and others say, that the neck of the lion is all composed of one unjointed bone. It appears indeed very rigid in this creature, but it does not proceed from so strange a cause, but is found owing to this, that the spinose apophyses of the vertebrae of the neck are long, and fastened together by extremely strong and rigid ligaments. The tongue of the lion is very rough and rigid, being covered with a great number of prominences of a hard matter, resembling that of a cat's claw, and nearly of the same size, the base of each being a round fleshy prominence on the surface of the tongue. The eyes of the lion are clear and bright, even after the creature is dead. The common observation that this creature sleeps with its eyes open, is founded on this, that it has a very thick membrane lodged in the greater canthus of the eyes, which it can extend over the whole eye upon occasion, as birds do their membrana nictitans, and thus will have no occasion to shut its eye-lids, in order to exclude the light. It is very remarkable that the common cat has all the singular structure of the se-

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veral parts as the lion has, its claws, feet, tongue and eyes, being of the same kind, and its internal parts bearing as strong a resemblance. The heart of the lion is greatly larger than that of any other creature of the same size, being six inches long, and four in diameter, in the largest part, and terminating in a very sharp point. The brain is as remarkably small; and upon the comparison of this with the great quantity of brain in a calf, and pursuing the observation through several other creatures, as to the porportion of brain they have, it does not appear that a small quantity of brain is a mark of folly, but usually of great subtlety, and of a cruel disposition. *Mem. pour l'Histoire des Anim.*

LIP, *Labium*, or *Labrum*, in anatomy, the exterior fleshy covering of the mouth.

HARE-LIPS, in surgery, a disorder in some persons wherein the upper-lip is so divided, as to resemble a hare's lip. This division is sometimes small, at other times it is double, like the letter M, and then termed the double hare-lip. Besides the deformity caused by this disorder, it hinders infants from sucking, and adults from speaking distinctly. Sometimes this accident happens to the lower lip from the ill treatment of a wound, and this is called the spurious hare-lip; the true kind is born with the infant. The less and more equal the fissure of the hare-lip is, it is generally so much the more easily cured. In some infants, the division of the lip is so large and irregular, that there can be but little hopes of a cure, which may, however, be easily performed on the very same lip, when adult. Sometimes too we meet with a tooth projecting forward into the fissure; in this case it cannot be cured without first taking out the tooth. In a recent hare-lip, or one made by a wound, the cure is to be performed by the knotted suture.

LIPOTHYMIA, in medicine, the name of a disease usually confounded with the syncope, but really different from it in many particulars.

The lipothymia is a very considerable abolition of the vital and animal faculties, at least to appearance: and the syncope is a plenary or a total abolition of them, as far as appears to us at the time. It is easy to see, however, that these are only two different stages of the same distemperature. The lipothymy is sometimes an idiopathic, sometimes a symptomatic disease, and most frequently attends

tends the scurvy, malignant fevers, and other disorders; the syncope is idiopathic, and attacks persons in health as well as those that are diseased. The lipothymy is always easily distinguished from a convulsed state of the body, by this, that the limbs are all flaccid in it. The syncope differs from death only in degree; and the body being flaccid in this, and growing rigid under the last convulsions in death, is the only distinction of them in extreme cases.

LIQUORICE, *liquoritia glycyrrhizza*, and *radix dulcis*, a sweet root of considerable use in medicine.

This plant, described by all the botanical authors under the name of *glycyrrhizza vulgaris*, grows to four or five feet high, its stalks are hard and woody, its leaves are small and roundish; and they stand many together on the two sides of a rib, making what authors call a winged leaf. They are viscous to the touch; the flowers are of the papilionaceous kind, small and bluish. The plant is of the diadelphia decandria of Linnaeus, and of the herbz flore papilionaceo seu leguminosae of Mr. Ray. Liquorice grows wild in many parts of France, Italy, Spain, and Germany. It is cultivated in great abundance in Yorkshire, and in many other parts of England; and by the good order we keep the soil in, produce better roots, longer, even, and more succulent than are to be had from any other part of the world. The rest of Europe is in great measure furnished by what grows about Bayonne and Saragossa in Spain.

The ground designed for liquorice must be well dug, and dunged the year before, that the dung may be thoroughly rotted in it; and just before it is planted, the earth is to be dug three spades deep, and laid very light. The plants to be set should be taken from the sides or heads of the old roots, and each must have a very good bud, or eye, otherwise they are subject to miscarry; they should also be about ten inches long, and perfectly sound. The best season for planting them is the end of February, or the beginning of March, and this must be done in the following manner: the rows must be marked by a line drawn a-cross the bed, at two feet distance; and the plants must be set in these by making a hole of their full depth, and something more, that the eye of the root may be an inch below the surface; they must also be set two feet distance from each other in the rows.

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When this is done, the ground may be sowed over with onions, which, not rooting deep, will do the liquorice roots no injury for the first year. In October, when the stalks of the liquorice are dead, a little very rotten dung should be spread over the surface of the ground. Three years after the time of planting, the liquorice will be fit to take up for use; and this should be done just when the stalks are dead off; for, if taken up sooner, the roots are very apt to shrink greatly in their weight. The roots about London look browner than those which have been propagated in a less rich soil, but then they are much larger, and grow quicker to their size. *Miller's Gard. Diet.*

Liquorice is an excellent medicine in coughs, and all disorders of the breast and lungs. It obtunds the sharpness of acrid and salt humours. It is also recommended against disorders of the kidneys and bladder, and is said to take off the sense of pain in many terrible complaints. It is an ingredient in almost all decoctions in ptisans, in which it is esteemed for obtunding acrimony, and for giving the whole a very pleasant taste, and drowning the worst flavour of the other ingredients.

LIQUORICE Juice, the inspissated juice of the common liquorice root, and is brought to us in rolls or cakes, covered usually with bay-leaves from Spain and Holland, from the first of which places it obtained the name of Spanish juice. It is to be chosen firm, but not tough, hard, and when broken, of a fine shining surface; such as perfectly melts in the mouth, and does not taste of burning, nor leaves any harsh or gritty particles between the teeth.

Liquorice juice has the same virtues with the root it is produced from. It is a very famous remedy among the common people for coughs and all disorders of the breast and lungs. It is commonly taken alone, holding a small piece of it in the mouth till it gradually melts there; but the more agreeable way of taking it is in form of lozenges, of which there are many kinds, which it is the basis of; in these it is mixed with other pectoral ingredients, and has the advantage of melting more easily in the mouth than in its own form. It is also an ingredient in the theriaca and some other of the compositions of the shops.

* **LISBON**, the capital city of the kingdom of Portugal. It was formerly con-

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siderable for its extent, handsome structures, riches, and its being the capital of the kingdom, the residence of the kings of Portugal, and an archbishop's see; but on the first of November, 1755, it was almost ruined by an earthquake. This city is built upon seven hills, and before that calamity, contained about thirty thousand houses, two hundred thousand inhabitants, forty parish churches, without taking in the monasteries, twenty-six gates on the side of the river Tagus, and seventeen on the land side. It had twenty monasteries for monks, and eighteen nunneries, containing at least two thousand persons. It is still a place of great trade, and much frequented. The houses of the citizens are very mean, with lattice windows, but those of the nobility are elegantly built with stone, with large gardens belonging thereto. The streets are narrow and steep, which makes it very inconvenient for coaches, and therefore litters are used in their stead; there are several handsome squares, the finest of which had the king's palace on one side, and on another side the river, from whence may be seen large fleets of ships at anchor, and others perpetually going in and out of that spacious harbour; in this square they had their bull fights, where people of all conditions assembled to behold them, and here also the officers of the inquisition performed those terrible executions on all those who differ from the Roman church. The harbour of Lisbon will contain several thousand sail of ships, the river being three miles over, and there are ships of every nation in Europe riding in it. Beyond this there is a beautiful country, intermixed with towns and villages. This city was surrounded only by a single wall, on which were seventy-seven antique towers, of no great strength. It is ten miles from the mouth of the Tagus, two hundred and fifty south-by-west of Madrid, eight hundred and thirty from Paris. Long. 8 2 W. Lat. 38 45 N.

LIST, in commerce, the border of cloth, or of a stuff; serving not only to shew their quality, but to preserve them from being torn in the operations of fulling, dyeing, and the like.

List is used on various occasions; but chiefly by gardeners, for securing their wall-trees.

LIST, in architecture, a little square moulding, otherwise called a fillet, listel, &c.

L I T

LITANY, a solemn form of supplication to God, in which the priest utters some things fit to be prayed for, and the people join in their intercession.

LITERATI, in general, denotes men of learning; but is more particularly used by the Chinese, for such persons as are able to read and write their language, which is remarkably difficult.

LITHARGE a metalline substance, formed of the spume of lead. This preparation, or, as it may be more properly called, recement of lead, is of two kinds, differing in colour, though in no other quality: the ancients, as well as moderns, observed this difference, and called the one litharge of gold, and the other litharge of silver. This recement of lead is not prepared by a formal process on purpose; it is collected from the furnaces where silver is separated from lead, or from those where gold and silver are purified by means of that metal; but in the furnaces used for either of these purposes, it is generally run into lead again to serve for the same or other uses. The litharge sold in the shops is produced in the copper works, where lead has been used to purify that metal, or to separate silver from it. The greatest quantities of litharge are brought from Sweden, Germany, and Denmark. Poland furnishes some, as does also England; but the Dantzic kind is esteemed the most valuable. The best litharge is that which is almost calcined, and of the liveliest colour. Litharge on the whole is properly lead vitrified, either alone or with a mixture of copper. Litharge is soluble in oil and all other unctuous substances, and thus dissolved, it makes the basis of a great part of the ointments and plasters of the shops. It is drying, abstergent, and slightly astringent; and hence it is of great use in cleansing ulcers, and disposing them to incarnate.

LITHONTRIPTICS, medicines which either break, or are supposed to have the virtue of breaking stones in the urinary passages.

LITHOPHYTA, in botany, a subdivision of plants, so called from their approaching to a stony hardness, comprehending the isis, spongia, millepora, tubipora, &c.

LITHOSPERMUM, gromwell, in botany, a genus of plants.

The seeds of which being the only parts used in medicine, are accounted diuretic. Emulsions are made of them, with dog's grass water.

LITHO-

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LITHOTOMY, in surgery, cutting for the stone. Mr. Sharp lays down the following method of searching for the stone. The patient being laid on an horizontal table with his thighs elevated, and a little extended, pass the sound, or catheter, with the concave part towards you, till it meets with some resistance in the perinæum, a little above the anus; then turning it without much force, push it gently on into the bladder, and if it meets with an obstruction at the neck, raise its extremity upwards, by inclining the handle of it towards you; and if it does not then slip in, withdraw it a quarter of an inch, and introducing your forefinger into the rectum, lift it up, and it will seldom fail to enter. Though, upon searching, the surgeon may be assured of a stone in the bladder, yet it is not without farther inquiry to operate immediately; since there are some obstacles that forbid the operation, either absolutely, or only for a certain time. Among these, that of the greatest consequence is the gravel or stone in the kidneys, which is known by the pain in the loins, vomiting, retraction of the testicles, numbness of the thighs, and often by matter which the inflammation produces in the kidneys. Difference of age makes an extreme difference in danger, infants and young people almost always recovering; but still the operation is advisable in those advanced in years, though it is not attended with near the same success. Before the operation is performed it is proper to prepare the patient with a gentle purge the preceding day, and a clyster early in the morning, which will be of great service in cooling the body and making the operation less dangerous, where the rectum is liable to be wounded when full.

The most convenient time for the operation of lithotomy is spring or autumn, though when the patient is in exquisite torment, or his life in danger, the present opportunity should be embraced. Lithotomy is of two kinds: that made into the bladder is termed cystotomy; but when the stone is in the kidneys, which very rarely happens, the operation is termed nephrotomy.

With respect to the several methods of performing lithotomy for the stone in the bladder, they, according to Heister, are four: the first, and most ancient, is the apparatus minor, called likewise the Celsian or Guidonian method: the second the apparatus magnus, or Marianus's

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method; the latter being termed the new, and the former the old method: the third is the apparatus altus, or the hypogastric section, wherein the incision is made at the lower part of the abdomen in the anterior side of the bladder, immediately above the os pubis; whereas in the rest it is made in the perinæum, between the anus and the scrotum: the fourth, and the most modern method, was invented towards the end of the last century, and is termed the lateral operation. The first method is now entirely laid aside, though Heister thinks it practicable on boys under fourteen: the wound of the bladder in this operation, says Sharpe, is made in the same place as is now practised in the lateral method; but its being impracticable on some subjects, and uncertain in all others, has made it to be universally exploded. Women are less subject to the stone in the bladder than men, and their urinary passages are more short and lax, so that in general the stone being but small, discharges itself with the urine, and when it happens to increase in the bladder, we have instances of its coming away spontaneously. Douglas proposes to extract a small stone in a woman, by dilating the urethra with a tent of gentian-root, or prepared sponge; but when the stone is large, he approves of the high operation, distending the bladder with warm water, and compressing the urethra by an assistant's finger in the vagina, and then making an incision into the bladder immediately above the os pubis. This Heister says, is a very proper method, when the stone is very large, and the patient young and healthy; but Morand, when the stone is small, prefers the apparatus major. Upon the whole, lithotomy appears to be a dangerous and precarious operation, nor can one method alone be depended on; but the surgeon must be determined in the choice, by the particular circumstances of the case.

Nephrotomy, the second species of lithotomy, is by most writers on the subject thought impracticable, who therefore absolutely reject it; though we have many instances of persons, who have been cured of wounds of the back penetrating to the kidneys. Heister mentions one cure of this kind performed by himself. Wounds, therefore, of the kidneys, especially those inflicted on the back, without penetrating into the cavity of the abdomen, he says, are often curable. Roussel, Riolanus, and others, think ne-

phrotomy may be practised with success, if the opening is made where the stone is perceptible, and neither the emulgent artery, vein, nor ureter, wounded, nor the cavity of the abdomen penetrated. But beyond all dispute it must be reasonable, when nature points out the place by a tumor or abscess in the loins, preceding from a stone in the kidneys.

LITURGY, a name given to those set forms of prayer which have been generally used in the Christian church. Of these there are not a few ascribed to the Apostles and Fathers. The liturgy of the church of England was composed in the year 1547, since which time it has undergone several alterations, the last of which was in the year 1661; and of this liturgy Dr. Comber gives the following character. "No church was ever blessed with so comprehensive; so exact, and so inoffensive a liturgy as ours; which is so judiciously contrived, that the whole may exercise at once their knowledge and devotion; and yet so plain, that the most ignorant may pray with understanding; so full, that nothing is omitted which ought to be asked in public; and so particular, that it compriseth most things which we would ask in private; and yet so short, as not to tire any that have true devotion. Its doctrine is pure and primitive; its ceremonies so few and innocent, that most of the Christian world agree in them: its method is exact and natural, its language significant and perspicuous, most of the words and phrases being taken out of the holy scripture, and the rest are the expressions of the first and purest ages."—And in the opinion of the most impartial and excellent Grotius, (who was no member of, nor had any obligation to this church) "the English liturgy comes so near the primitive pattern, that none of the reformed churches can compare with it." Again, he says, "In the prayers a scholar can discern close logic, pleasing rhetoric, pure divinity, and the very marrow of the ancient doctrine and discipline; and yet all made so familiar, that the unlearned may safely say, Amen."

LITUS, in Roman antiquity, a short straight rod, only bending a little at one end, used by the augurs. See *augur*.

LIVER, *Hepar*, in anatomy, a large and pretty solid mass of a dark red colour, a little inclined to a flow, situated immediately under the arch of the diaphragm, partly in the right hypochondrium, which it fills almost entirely, and

partly in the epigastrium, between the appendix ensiformis and spina dorsi, and terminating commonly in the left hypochondrium, into which it sometimes runs a considerable way. It is composed of several kinds of vessels, the ramifications of which are multiplied in an astonishing manner and form, by the intertexture of their capillary extremities, an innumerable collection of small, pulpy, friable corpuscles, which are looked upon to be so many organs designed to separate from the mass of blood a particular fluid termed the bile.

LIVERY of *Seisin*, in law, signifies delivering the possession of lands, &c to him who has a right to them.

LIVERYMEN, of London, citizens who have taken up their livery in their respective companies: and they alone have the privilege of giving their votes for members of parliament, from which the rest of the citizens are excluded.

LIVRE, a French money of account, containing twenty sols.

* **LIVY** (**TITUS**) a celebrated Latin historian, born of an illustrious family at Padua. On his going to Rome he acquired illustrious friends, and particularly obtained the esteem of Augustus, who furnished him with memoirs for writing his Roman history. After that prince's death Livy returned to Padua, where he died on the same day with Ovid, in the year 21, and in the fourth year of the reign of Tiberius. Of all his works he acquired most reputation by his Roman history, which begins with the foundation of Rome, and ends with the death of Drusus in Germany. This history was divided into one hundred and forty books, of which there are only thirty-five remaining; but the excellence of these make the learned extremely regret the loss of the others, and no pains have been spared in order to recover them, yet all their researches have been to no purpose.

LIXIVIOUS, *Lixivate*, in chemistry, such salts as are extracted from the ashes of burnt vegetables by means of lotion.

LIXIVIUM, a ley, or water impregnated with the salts of burnt vegetables. What is left after the evaporation of such a liquor is called a lixivious salt.

Lixiviums are of great use in medicine, bleaching, sugar-works, &c.

LIZARD, *Lacerta*, in zoology, a genus of amphibious animals, the body of which is oblong and rounded, the legs

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four, and the hinder part terminated by a tapering tail.

LOACH, the English name of a fish, called by Artedi, the smooth spotted cobitis, with a cylindrical body.

LOAD, among miners, denotes a vein of ore.

LOADSTONE, the same with magnet.

LOAMS, in natural history, are defined to be earths, composed of dissimilar particles, hard, stiff, dense, and hard and rough to the touch; not easily ductile while moist, readily dissoluble in water, and composed of sand, and a tough viscid clay. Of these loams, some are whitish, and others brown or yellow.

LOBE, in anatomy, denotes each of the two parts of which the lungs consist. It is also applied to the divisions of the liver.

LOCAL, in law, something fixed to the freehold, or tied to a certain place: thus real actions are local, since they must be brought in the county where they lie; and local customs are those peculiar to certain counties and places.

LOCAL PROBLEM, among mathematicians, such a one as is capable of an infinite number of different solutions, because the point which is to resolve the problem may be indifferently taken within a certain extent, as suppose any where, within such a line, within such a plane figure, &c. which is called a geometric locus, and the problem is said to be a local or indetermined one.

LOCHIA, in physic, the purgations of the uterus after child-birth. These consist, generally, for the two first days, of a kind of bloody serosity, and gradually become more white, viscous, and less in quantity; which, during the whole time, cannot be determined, some women having more, others less: nor can the duration of the flux be limited to any particular time. The lochia sometimes flow in too large quantities, either on account of something retained in the uterus, which prevents it from contracting duly; or a too great fluidity or agitation of the blood. If it proceed from a retention of something in the uterus, this must, if possible, be taken away by the hand. But if it proceed from a too great fluidity or agitation of the blood, tempering decoctions of barley, jellies, emulsions, opiates, and astringents, are to be administered. But when a deficiency in the lochia, or their utter suppression, happens, all possible means

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should be used to procure this salutary discharge. For this purpose mild antacids, diluters, and aperients, are to be exhibited. But great stress is to be laid on aperient and relaxing topics, clysters, fomentations, plasters, liniments, cupping on the inferior parts, pessaries and suppositories. Boerhaave advises not to let blood in the above-mentioned disorders, without the utmost necessity.

LOCK, a well-known instrument for securing doors, chests, &c. and only to be opened by a key.

* **LOCKE (JOHN)** a great philosopher, and one of the greatest men England has produced, was born at Wrington, not far from Bristol, on the 29th of August 1632. He studied first at Westminster-school, whence he removed to Christchurch in Oxford, and there discovered such a genius for the sciences, that he soon passed for one of the most judicious critics of his time: he was, however, highly disgusted at the method of study then pursued in the university, there being nothing taught there but the Aristotelian philosophy, embarrassed with obscure terms and useless questions. He disapproved also of the formal disputes held in the schools, which he thought only served to produce or nourish prejudices and ostentation. The first books which gave him a relish for the study of philosophy were those of Des Cartes; for though he afterwards followed opinions contrary to those of that philosopher; yet he admired him for his perspicuity. Mr. Locke also applied himself to the study of physic, in which the learned Sydenham allows that he made a very great progress; but he never took upon himself that profession. In 1664 he went to Germany, was secretary to Sir William Swan, envoy from the English court to the elector of Brandenburg, but in less than a year returned to England, where he applied himself to the study of natural philosophy at Oxford, and there became acquainted with the lord Ashley, afterwards earl of Shaftesbury, who introduced him into the conversation of the most learned men of that time, with whom he contracted a strict friendship, which lasted as long as his life. In 1668 he attended the earl and countess of Northumberland into France. At his return to England he lived with the lord Ashley, as he had done before, and took upon himself the care of his son's education. That nobleman being made lord chancellor

chancellor of England in 1672, appointed him secretary of the presentations, which place he held till the end of 1673, when the earl resigned the great seal. Mr. Locke was the same year made secretary to a commission of trade; but that commission being dissolved in December, 1674, and finding himself threatened with a consumption, he went the next year to Montpellier, where he staid a considerable time, and there became acquainted with the lord Herbert, earl of Pembroke. Some time after, the earl of Shaftesbury being retired to Holland, Mr. Locke went to him there, and contracted an intimate friendship with Limborch, Le Clerc, and other learned men. He was then accused at court of having composed certain tracts against the government, printed in Holland, on which his place of student of Christ-church was taken from him by a special order from king Charles II. but these tracts were afterwards discovered to be written by another person. After the death of king Charles II. Mr. William Penn offered his interest to procure a pardon for him from king James II. but Mr. Locke said he had no need of a pardon, since he had not been guilty of any crime. In 1687 the English envoy at the Hague demanded him and eighty-three other persons to be delivered up by the States General, for being concerned in the Duke of Monmouth's rebellion, though he held no correspondence with him. This obliged Mr. Locke to keep himself concealed for several months, till his innocence being known, he again appeared in public. In 1689 he returned to England in the fleet which conveyed the princess of Orange. He might then have easily obtained a very considerable post; but he contented himself with being one of the commissioners of appeals, worth 200 l. per annum. About the same year he was offered to go abroad as envoy to the emperor, or any other court where the air would be most suitable to him, but he waved it on account of his ill state of health. In 1695 he was appointed one of the commissioners of trade and plantations, a place worth 1000 l. per annum, which he discharged with great success till the year 1700, when he resigned on account of his asthmatic disorder. After he had resigned his commission, he lived at Oates in Essex, a country seat of Sir Francis Masham's, where he spent the remainder of his life in the study of the scriptures, and died there the

28th of October 1704, in the 73d year of his age. His writings will render his name immortal. The principal of these are, 1. His essay on the human understanding. 2. Thoughts on education. 3. Two treatises on government. 4. The reasonableness of Christianity. 5. A paraphrase and notes on the epistles of St. Paul, &c.

LOCUS GEOMETRICUS, in geometry, denotes a line, by any point of which a local or indeterminate problem is solved.

If a right line suffice for the construction of the equation, it is called locus ad rectam; if a circle, locus ad circulum; and these were called plain loci: if a parabola, hyperbola, locus ad parabolam, hyperbolam, &c. And these were called solid loci.

Wolffius and the moderns more commodiously divide loci into orders, according to the number of dimensions to which the indeterminate quantifies rise.

LOCUST, *Locusta*, a genus of insects, comprehending the locust, simply so called, the several species of other locusts and grasshoppers, with the crickets of the house and field. Willoughby observes, that in these animals there are always more males than females, which is contrary to the order of nature in other insects, where the females are much the most numerous: and Swammerdam observes, that it is only the males that make a noise, which he says they do by a swift vibration of their wings, either against one another, or against their legs.

The nymph, or worm of the locust, scarce at all differs from the creature in its perfect state. It moves and eats in the nymph state, and all the visible difference is, that the wings are not expanded as in the perfect locust, but are gathered up in a small compass, and form four little buttons on the shoulders. It is observed, that towards the end of summer the males are very tender of the females, three or four of them being frequently seen gathered about one of that sex, and seeming to do her all the kind offices in their power, fluttering about with their wings, and rubbing her with their fore legs. The males are always more brisk and nimble than the females; and, amongst all the kinds of locusts, there are a great many naturally imperfect; particularly many have only one hinder leg, yet these hop almost as well as the rest. The country of the Colchicks or Ukraine is, in dry summers, much

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infested with swarms of locusts driven thither by an east or south east wind. The number of these insects is so great, that they darken the air, and devour all the corn of the country. They lay their eggs in autumn, and then die. It is said that each of these creatures lays two or three hundred eggs, which hatching the ensuing spring, produce such a number of locusts, that they do far more mischief than before, unless the rains fall, which kill both the eggs and the insects, or unless a strong north or north-west wind arises, which drives all into the Euxine sea. The hogs of the country are fond of these eggs, and devour great quantities of them. In the night, when these insects rest on the ground, they cover it to the height of three or four inches. If a wheel passes over them, they emit an intolerable stench. *Plin. Transf. No. 8.*

Water LOCUST, *Locusta Aquatica*, the name given by authors to a species of water insect, somewhat resembling the locust kind in shape.

LOCUSTÆ, in botany, the tender extremities of the branches of trees, such as, it is supposed, St. John the Baptist fed on in the wilderness.

LODGMET, in military affairs, a work raised with earth, gabions, fascines, wool-packs, or mantelets, to cover the besiegers from the enemy's fire, and to prevent their losing a place which they have gained, and are resolved; if possible, to keep.

LOG, in naval affairs, a small triangular piece of board used on board a ship; into one end of which a convenient quantity of lead is cast, to make it swim upright, the other end being fastened to the log-line.

LOG-LINE, a line fastened to one end of the log, and wound upon a reel.

This line is generally divided into certain spaces, which are, or ought at least to be, such a proportional part of a nautical mile, sixty of which make a degree of a great circle, as half a minute, the time allowed for the experiment, is of an hour. Now a common nautical or sea mile, according to an experiment made by Mr. Richard Norwood, and with which the French nearly agree, is ≈ 6120 English feet, which being divided by 120, the half minutes in an hour, gives fifty-one feet for the distance between each division on the log-line. These divisions or spaces are called knots, because at the end of each division there is a

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piece of twine with knots in it raised between the stands of the line, whereby the number of divisions or knots run off the reel, during the half minute, are readily counted. And because it is requisite that the log be out of the eddy of the ship's wake before they begin to count, therefore these knots or spaces begin at the distance of ten fathoms or sixty feet from the log, at which point, for the more ready discovering it, there is fastened a piece of red rag. The log-line being thus prepared and wound upon a reel, heave the log over board from the poop, and as soon as the log is out of the ship's eddy, or the red rag at your hand, let your assistant turn the half minute glass; then veer the line from off the reel, which easily turns as the ship sails from the log, till the half-minute glass is run out, at which time stop the line, and the number of knots intercepted between your hand and the red rag, will shew how far the ship has run in that time, and, consequently, her rate of sailing. For since the distance comprehended between each knot bears the same proportion to a nautical mile as half a minute does to an hour, therefore as many knots as are run out in half a minute, so many miles will a ship sail in an hour, supposing her to move with the same velocity during that time. But as many accidents attend a ship during a day's sailing, such as the variableness of winds, the different quantity of sail carried, &c. it will be necessary to have the log at every alteration; but if none of these alterations be perceptible, yet it ought to be constantly heaved, at least every hour. As the log-line is apt to stretch and shrink, and the half-minute glass to alter, they ought to be often examined, and when found amiss, rectified. The generality of our seamen, upon a supposition that sixty English miles are equal to a degree of a great circle, make the distance between knot and knot but forty feet; but as this supposition is evidently false, it were greatly to be wished that they would constantly use the former limitation, being in every respect as easy, and much more sure and certain; and the rather, as they are at the same time obliged by experience to shorten the half-minute glass nearly four seconds, which is nothing less than correcting one blunder by another.

LOG-BOARD, a table generally divided into five columns, in the first of which is entered the hour of the day; in the second, the course steered; in the third,

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third, the number of knots ran off the reel each time of heaving the log; in the fourth, from what point the wind blows, and in the fifth, observations on the weather, variation of the compass, &c.

LOG-BOOK, a book ruled in columns, like the log-board, into which the account on the log-board is transcribed every day at noon; from whence, after it is corrected, &c. it is entered into the journal.

LOG-WOOD, or Campeachy wood, the wood of a low prickly tree, which grows plentifully about Campeachy on the bay of Honduras. Log-wood gives out its colour both to watery and spirituous menstrua, but not readily to either: it requires to be rasped and ground into fine powder, and boiled in several fresh parcels of the liquors. Rectified spirit extracts the colour more easily, and from a larger proportion of the wood than water does. The tinctures both in water and in spirit are of a fine red, with an admixture, particularly in the watery one, of a violet or purple. Volatile alkaline salts or spirits incline the colour more to purple: the vegetable and nitrous acids render it pale; the vitriolic and marine acids deepen it. The watery decoction, wrote with on paper, loses its redness in a few days, and becomes wholly violet. This colour communicates also to woollen cloth previously prepared by boiling with a solution of alum and tartar: the dye is beautiful, but very perishable. It is often used by the dyers, as an ingredient in compound colours, for procuring certain shades which are not easily hit by other materials. With chalybeate solutions, it strikes a black. Hence it is employed in conjunction with those liquors, for staining wood black for picture-frames, &c. and with the addition of galls, for dyeing cloth and hats black. The black dyes, in which this wood is an ingredient, have a particular lustre and softness, far beyond those made with galls and vitriol alone: the beauty, however, which it here imparts, is not permanent, any more than its own natural violet dye. On the same principle, it improves also the lustre and blackness of writing ink. Ink made with vitriol and galls, does not attain to its full blackness till after it has lain some time upon the paper: a due addition of logwood renders it of a deep black as it flows from the pen, especially when vinegar or white wine is used for the menstruum.

LOGARITHMIC Curve, a curve which

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explains the nature and property of logarithms, and is delineated in the following manner:

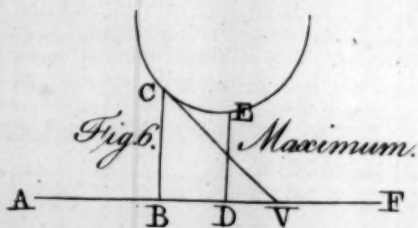
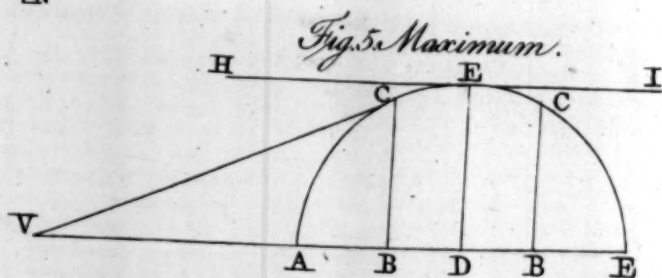
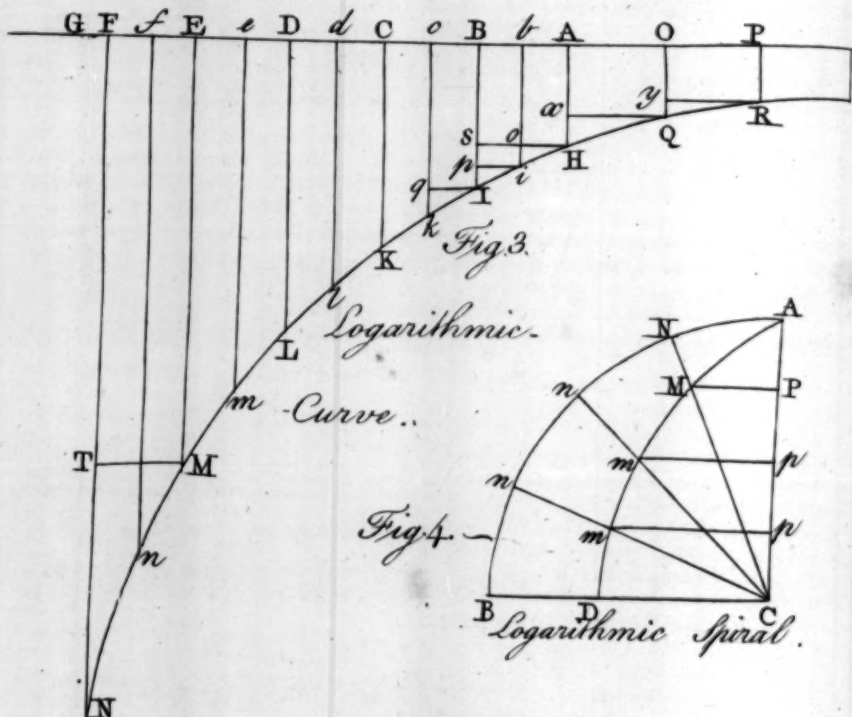
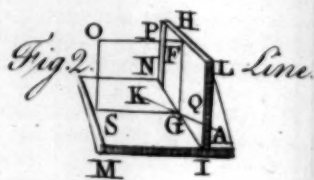
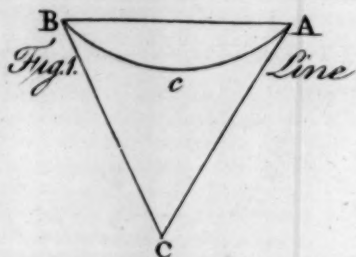
Upon the line *AG* (plate XXIX. fig. 3.) infinitely extended each way, let there be taken *AB*, *BC*, *CD*, *DE*, *EF*, &c. towards the right hand; also *AO*, *OP*, &c. towards the left, all equal among themselves; and from the several points *P*, *O*, *A*, *B*, *C*, *D*, *E*, *F*, &c. let there be drawn the lines *RP*, *OQ*, *AH*, *BI*, *CK*, *DL*, *EM*, *FN*, &c. equal in length to the several lines, in the geometrical scale of proportional lines, infinite in number; these therefore will represent so many terms in the progression of proportionals, of which the line *AH* represents unity. Now if the extremities, *R*, *Q*, *H*, *I*, *K*, *L*, *M*, *N*, &c. of the geometrical scale of mean proportionals be connected together by right-lines, the figure *PRNF* will be a polygon, consisting of more or fewer sides, according as the terms in the scales of mean proportionals are more or fewer in number.

If the distances *AB*, *BC*, *DE*, *EF*, &c. are bisected in the points *b*, *c*, *d*, *e*, *f*, &c. and from these points be drawn lines, as *bi*, *ck*, *dl*, *em*, *fn*, &c. perpendicular to *AG*, which will be so many proportionals between *AH*, *BI*, *CK*, *DL*, *EM*, *FN*, &c. double in number to those of the former scale. And if the extremities *H*, *i*, *k*, *L*, *M*, *N*, &c. be connected together by right-lines, we shall have a new polygon, consisting of a greater number of sides; but each side is less in magnitude.

After the same manner, if the distance between every two terms be continually bisected, and to each of the points, so found, there be applied a series of mean proportionals, the number of terms in this new scale, as also the sides of the polygon, will by this means become infinite; and each side of the polygon will be less than any given right-line, and consequently the polygon will be changed into a curve-lined figure; since every curvilinear figure may be considered as a polygon of an infinite number of sides. The curve thus described is called the logarithmic curve, in which if the right-lines *AH*, *BI*, &c. which stand at right-angles to the axis *AG*, represent so many terms in a series of numbers in geometrical progression, the portions of the axis *AB*, *BG*, &c. between the place of

unity





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unity and any given term, will shew the place or order that each number in the scale of geometrical proportionals obtains from the place of unity in the same series.

The distance therefore between any two numbers, in this continued scale of geometrical proportionals, is the logarithm of the ratio of these two numbers the one to the other. See *Logarithms*.

LOGARITHMIC Spiral. If the quadrant of a circle *ANB* (plate XXIX. fig. 4.) be divided into any number of equal parts, in the points *N, n, n, &c.* and from the radii *CN, Cn, Cn, &c.* be cut off *CM, Cm, Cm, &c.* continual proportionals, the points *M, m, m, m, &c.* will be in the logarithmic spiral. And there may be imagined an infinite number of different curves of this kind.

LOGARITHMS, a set of artificial numbers, whereby the common operations in multiplication and division are, performed by addition and subtraction; raising powers and extracting roots, are, by the help of these numbers, easily performed by multiplication and division.

Logarithms, justly esteemed one of the greatest and most useful discoveries that the last century has produced, were first invented by John Neper, baron of Marchiston, in Scotland, and by him first published at Edinburgh, in the year 1614, and so on after by himself, and Mr. Briggs, (then Savilian professor of geometry in the university of Oxford) reduced into a better form, and published in London in the year 1624, in the same form and manner as they are used at this day.

Logarithms may be considered as, and are usually defined to be, a series or rank of numbers in an arithmetical progression, fitted or adapted to the exponents of a series of numbers in a geometrical progression.

If between 1 and *x* be inserted a mean proportional, which is $\sqrt{x}$ or $x^{\frac{1}{2}}$, its index $\frac{1}{2}$ shews that its distance from unity will be but one half of the distance of *x* from unity. In like manner, if between *x* and *x* we insert a mean proportional, its index will be 1 and $\frac{1}{2}$ or $\frac{3}{2}$, inasmuch as its distance from unity is once and a half the distance of *x* from the same place of unity.

Again, if between 1 and *x* be inserted two mean proportionals, the first of these will be the cube-root of *x* or $\sqrt[3]{x}$, and its index will be $\frac{1}{3}$, inasmuch as its distance from the units place is but $\frac{1}{3}$ of the dis-

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tance of *x*, from the same place of unity; and consequently $\sqrt[3]{x}$ is expressed by $x^{\frac{1}{3}}$, whence it follows that the index of unity is 0, inasmuch as unity cannot be removed at any distance from itself.

And the same series of geometrical proportionals may be continued on the contrary side of unity, or towards the left hand, and which therefore will decrease in the same manner, or in the same ratio, as the terms placed on the right hand increase.

For the terms $\frac{1}{x^3}, \frac{1}{x^2}, \frac{1}{x}, \frac{1}{x}, \frac{1}{x}, 1, x, x^2, x^3, x^4, x^5, &c.$ are in the same geometrical progression continued, and have all the same common ratio; wherefore, inasmuch as the distance of *x* from unity towards the right hand is positive,

or $+$ 1, the distance of $\frac{1}{x}$ from unity towards the left hand, which is equal to the former, is negative or $-$ 1, which is therefore the index of $\frac{1}{x}$, and consequently for $\frac{1}{x}$ may be written x^{-1} .

Again, inasmuch as x^2 is on the right side of unity, and positive, and its index $+$ 2, the index of $\frac{1}{x^2}$, which is as far distant from unity on the contrary side, or towards the left hand, will be negative, and $-$ 2, and consequently $\frac{1}{x^2}$ is the same

with x^{-2} : In like manner x^{-3} is the same with $\frac{1}{x^3}$, and x^{-4} same with $\frac{1}{x^4}$; whence it comes to pass that the negative indices shew that the terms to which they belong, are as far distant from unity toward the left hand, as the terms whose indices are the same and positive, are removed from unity on the contrary side, or towards the right hand.

Again, as between 1 and *x*, in the series increasing from or on the right hand of unity, may be inserted a mean proportional as $\sqrt{x}$, and between this mean proportional and unity be inserted another mean proportional as $\sqrt[4]{x}$, and between the last mean proportional and unity be inserted another mean proportional as $\sqrt[8]{x}$, &c. whose respective indices will be $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, &c.$ so between unity and the next term $\frac{1}{x}$ in the series

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decreasing from unity, or on the left hand of unity, may be inserted a mean proportional as $\frac{1}{\sqrt{x}}$, whose correspondent index will be $-\frac{1}{2}$: and, again, between this mean proportional and unity, may another mean proportional, as $\frac{1}{4\sqrt{x}}$, be

inserted, whose correspondent index will be $-\frac{1}{4}$, and between this and unity may another mean proportional be inserted; the index will be $-\frac{1}{8}$, &c. and as this may be done between any other two terms of the progression, it follows, that between any two terms may an infinite number of mean proportionals be inserted, whose respective indices will become the logarithms of the respective terms to which they belong: and these mean proportionals, the greater they are in number between the two terms of any ratio, the nearer do they approach to a ratio of equality, with their correspondent indices or exponents.

Hence we are let into the reason of the ancient way of making logarithms, and which was made use of by their first inventors, and that was by a continual extraction of the square root. In order to this, they first extracted the square of 10, and having continued that root to a very great number of places, they extracted the square-root again, and so on continually until they at last, after 54 such extractions, obtained the number 1,000000000000001278191493200323442. Now if this number be first squared, then cubed, then raised to the fourth, fifth, &c. power, it is very certain that, as their increase in the several products arise but by slow degrees, there will among them be found such as are extremely near in value to the natural numbers 2, 3, 4, 5, &c. and consequently, by what has been already said concerning the nature of logarithms, those of the natural numbers 2, 3, 4, 5, &c. will be expounded by the exponents, or number of multiplications, which formed the products respectively equal (or nearly so) to the natural numbers 2, 3, 4, 5, 6, &c. Here we see the reason why the logarithm of 1 is 0, or rather, that 1 has no logarithm, because the quantity to be continually involved must be a small matter greater than 1; for if it be less, the powers will decrease it.

If logarithms are to be made only to seven places of figures, which are sufficient for common use, twenty-five suc-

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cessive extractions will do for that purpose; that is, we need only extract the 33554432. (or 2 raised to the 25th power) root of 10; because in that root there will be found seven cyphers before the first significant figure after the unit; and in the course of these extractions, the denominators of the fractions expounding those roots which are nearest in value to any of the natural numbers 2, 3, 4, 5, &c. will point out their respective logarithms.

Some have considered the logarithm of a number as the logarithm of the ratio of unity to that number itself, or as the distance between unity and that number in a geometrical scale of proportionals, and consequently measured by the number of proportionals contained between them: logarithms therefore expound the place or order that every number obtains from the unit's place in a continued series or scale of proportionals indefinite in number.

Thus, if between unity and the number 10, there be supposed 10000000, &c. mean proportionals, that is, if the number 10 be placed in the 10000000th place from unity, between 1 and 2, there will be found 3010300 of such proportionals; that is, the number 2 will be placed in the 3010300th place from unity; between 1 and 3 there will be found 4771213 of the same proportionals, or the number 3 will stand in the 4771213th place in the indefinite scale of proportionals; their numbers 10000000, 3010300, & 4771213, are therefore the logarithms of 10, 2, and 3; or, more properly, the logarithms of the ratios of those numbers one to the other.

Again, if between unity and the number 10, there be supposed an indefinite scale of mean proportionals, whose number is 23025851; that is, if the number 10 be placed in the 23025851st place from unity, in the indefinite scale of proportionals, between 1 and 2, there will be found to be 6931471 such mean proportionals; and between 1 and 3, there will be found 10986122 of the same proportionals: so that if the first term of the series be called x , the second term will be x^2 , the third x^3 , &c. and if the number 10 be supposed to be the 10000000th term in the series, the number 2 will be the 3010300th term, and the number 3 will be the 4771213th term in the same series; and consequently $x^{10000000} = 10$, $x^{3010300} = 2$, and $x^{4771213} = 3$, &c. and again, if the number 10 be supposed the

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the 3025851st term in the series, the number 2 will be the 6931471st term, and the number 3 the 10986122d term in the same series; and consequently, in this case, $x^{23025851} = 10$, $x^{6931471} = 2$, and $x^{10986122} = 3$, &c.

And as the indefinite number of mean proportionals between any two numbers may be assumed at pleasure, hence logarithms may be of as many different forms (that is, there may be as many different scales of logarithms) as there can be assumed different scales of mean proportionals between any two numbers. Every number therefore is some certain power of that number which is placed next to unity in the indefinite scale of proportionals between unity and the given number, and the index of that power is the logarithm of the number.

Logarithms therefore may be of as many sorts as you can assume different indices of the power of that number whose logarithm is required.

But since fluxions and the higher geometry have been so well understood, mathematicians have directed their views towards facilitating those laborious and operose calculations formerly made use of for constructing tables of logarithms, by help of converging series; and other means, whereby the logarithms of any proposed numbers may now be obtained with very little trouble: an example of this kind may be seen in Maclaurin's Fluxions, p. 678, vol. ii. where that celebrated mathematician shews that, the logarithm of m being given, the logarithm of

$$m+z - \log. m \text{ is equal to } \frac{z}{2m+z} \text{ multiplied by the series } 1 - \frac{z}{12m+z} \times \frac{1}{m} - \frac{z^2}{360m^2+z^2} \times \frac{1}{m^2} - \frac{z^3}{1260m^3+z^3} \times \frac{1}{m^3} - \frac{1}{m^4} + \&c. \text{ This series converges so}$$

very swift, that two or three terms are sufficient in almost any case whatsoever.

The indices, or characteristics of logarithms, correspond to the denominative part of the natural numbers, as the other member of the logarithm does to the denominative part of the number: that is, the index shews the denomination, or place of the last (or left hand) figure of the number, and consequently of all the rest.—Thus 0, affixed to a logarithm, de-

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notes the last figure of the number to which the logarithm answers, to be nothing distant from (i. e. in) the place of units. The index 1 shews the last figure of its number to be distant 1 place from the place of units, i. e. to be in the place of tens, and consequently the number itself to be either 10, or some number between that and 100, and so of the other indices.—Hence all numbers which have the same denomination, but not the same numerative parts, are all numbers from 10 to 100, from 100 to 1000, &c. and will have logarithms whose indices are the same, but the other members different. Again, all numbers which have the same numerative, but not the same denominative part, will have different indices, but the rest of the logarithms the same. If a number be purely decimal; to its logarithm is affixed a negative index, shewing the distance of its first real figure, from the place of units. Thus the logarithm of the decimal .256 is $\bar{1}.43824$; of the decimal .0256 is $\bar{2}.30824$, &c.

To find the logarithm for a number greater than any in the common tables, but less than 10000000.—Cut off four figures on the left hand of the given number, and seek the logarithm in the table; add as many units to the index as there are figures remaining on the right; subtract the logarithm found from the next following it in the table; then, as the difference of numbers in the canon is to the tabular difference of the logarithms answering to them, so are the remaining figures of the given number to the logarithmic difference; which if it be added to the logarithm before found, the sum will be the logarithm required. Suppose the logarithm of the number 92375 were required. Cut off the four figures 9237, and to the characteristic of the logarithm corresponding to them add an unit; then

From the logarith. of the
number - - - 9238 = 3,9655780
Subtract logarith. num-
ber - - - 9237 = 3,9655309
Remains tabular difference 471

$$10 - 471 = 5$$

$$5) 2 - - - 1$$

$$235$$

Now to the logarithm — 4,9655309
Add the difference found - 235
The sum is the logarithm
required - - - 4,9655544

To find the logarithm of a proper fraction.—Subtract the logarithm of the nu-
L 2 merator

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merator from that of the denominator, and to the remainder prefix the sign of subtraction. — Thus suppose it were required to find the logarithm of $\frac{3}{7}$,

Logarithm of 7 = 0,8450980

Logarithm of 3 = 0,4771213

Logarithm of $\frac{3}{7}$ = 0,3679767

To find the number corresponding to a logarithm greater than any in the table. First, from the given logarithm subtract the logarithm of 10, or 100, or 1000, or 10000, till you have a logarithm that will come within the compass of the table; find the number corresponding to this, and multiply it by 10, or 100, or 1000, or 10000, the product is the number required. Suppose, for instance, the number corresponding to the logarithm 7,7589982 be required, subtract the logarithm of the number 10000, which is 4,0000000, from 7,7589982; the remainder is 3,7589982, the number corresponding to which is 5741,1, which multiplied by 10000, gives 57411000, the number required.

To find the number corresponding to a negative logarithm. — To the given negative logarithm, add the last logarithm of the table, or that of the number 10000 i. e., subtract the first from the second, and find the number corresponding to the remainder; this will be the numerator of the fraction, whose denominator will be 10000. Suppose it be required to find the fraction corresponding to the negative logarithm 0,3679767, subtract this from - - 4,0000000

the remainder is 3,6320233, the number corresponding to which is 4285 $\frac{71}{100}$; the fraction sought therefore is $\frac{428571}{100000}$.

The reason of the rule is, that as a fraction is the quotient, arising from the division of the numerator by the denominator, unity will be to the fraction, as the denominator to the numerator; but as unity is to the fraction corresponding to the given negative logarithm; so is 10000 to the number corresponding to the remainder: therefore if 10000 be taken for the denominator, the number will be the numerator of the fraction required.

To find a fourth proportional to three given numbers, add the logarithm of the second to that of the third, and from the sum subtract the logarithm of the first: the remainder is the logarithm of the fourth required. Let the given numbers be 4, 68, and 3.

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Logarithm - 68 = 1,8325089

Logarithm - 3 = 0,4771213

Sum - - = 2,3096302

Logarithm - 4 = 0,6020600

Logarithm required 1,7075732

The number in the tables corresponding to which is 51.

LOGIC, λογική, the art of thinking and reasoning justly; or, it may be defined, the science or history of the human mind, inasmuch as it traces the progress of our knowledge from our first and most simple ideas through all their different combinations, conceptions, and all those numerous deductions that result from variously comparing them one with another. See the articles IDEA and KNOWLEDGE.

The precise business of logic, therefore, is to explain the nature of the human mind, and the proper manner of conducting its several powers, in order to the attainment of truth and knowledge. It lays open those errors and mistakes we are apt, through inattention, to run into; and teaches us how to distinguish between truth, and what only carries the appearance of it. By this means we grow acquainted with the nature and force of the understanding; see what things lie within its reach; where we may attain certainty and demonstration; and when we must be contented with probability.

These considerations sufficiently evince the usefulness of this science, which is divided into four parts, according to the number of the operations of the mind in its search after knowledge, viz. perception, judgment, reasoning, and method. See the articles Perception, &c.

This valuable art of ranging our ideas, connecting them closely together, and consequently of facilitating the transition from one to another, supplies us with a means of rendering all men's abilities nearly equal. In fact, all our knowledge is reducible to primitive sensations, which is nearly alike in all men. The art of combining and connecting our direct ideas only gives them a more or less exact arrangement and denomination; whence they become more or less sensible to others. A man who readily combines his ideas, differs but little from him who combines them slowly; as he who judges of a picture at sight differs but little from him who requires to be made sensible of all its parts: both at the first glance have the same sensations, though they sink

not

not so deep in the second, who therefore dwells longer upon each, to render them strong and distinct; and by this means the reflex ideas of the first observer become as easy to the second as direct ones. And hence, perhaps, there is scarce an art or science that may not, by means of a well-adapted logic, be taught to a slow understanding; because there are few arts or sciences whose precepts or rules may not be reduced to simple notions, and disposed in so connected an order, that the chain need never be broken. As the mind is more or less slow in its operations, it requires more or less of this connected order. The advantage of a genius is that of having less occasion for it; or rather, of being able to form it quick and almost imperceptibly. See *Demonstration*.

LOINS, *Lumbi*, in anatomy, the two lateral parts of the umbilical region of the abdomen.

LOLIUM, darnel, in botany, a genus of plants, the seed of which is reckoned attenuant, abstergent, drying, and heating.

LONCHITIS, spleenwort, in botany, a genus of plants, the leaves of which are of use in healing wounds, and in preventing inflammations of them; they are also used against the spleen: the root is aperient and diuretic.

* LONDON, a city and county of itself, in Middlesex, the see of a bishop, the metropolis of Great Britain, and of all the British dominions. It is the royal residence, and is situated chiefly on the north bank of the river Thames; part of it, namely, the borough of Southwark, a dependency of the city of London, being in Surry, and on the south banks of that river. Whence its name is derived is not easily determined, though there are various conjectures about it: we only know that it was a remarkable place in the time of the Romans; for Tacitus, who lived in the reign of Domitian, says, that London was a town very famous for trade; and Ammianus Marcellinus calls it an old town; and that later ages, after it became a Roman town, called it Augusta. Within the city-walls, and its ancient bars and gates, it takes in but a narrow compass; but if in the general acceptation of London we take in all that vast mass of buildings, reaching from Blackwall in the E. to Tothill-fields in the W. from London bridge, or river, S. to Islington, N. and from Peterborough-house, on the Bank-side at Westminster, to Cavendish-

square, and even to Marybone, and all the new buildings by and beyond Grosvenor and Hanover squares, to the Brentford-road one way, to the Acton road another; a prodigy all this, of such buildings as nothing in the world does, or ever did surpass, except it was old Rome in Trajan's time, when the walls of that city were fifty miles in circuit, and the number of its inhabitants 6,800,000. It had seven gates by land, namely, Ludgate, Aldgate, Cripplegate, Newgate, Aldersgate, Moorgate, and Bishopsgate; of which the three first were taken down in September 1760. On the side of the water there were Dowgate and Billingsgate, long since demolished, as well as the Postern-gate near the Tower, and the greatest part of the walls. In the year 1670 there was a gate erected, called Temple-bar, which determined the bounds of the city westward. This city has undergone great calamities of various kinds; but the two last were most remarkable, that is, the plague in 1665, which swept away 68,596 persons; and the fire in 1666, which burnt down 13,200 dwelling-houses; in memory of this last there is a column erected, called the Monument, near the place where it began, which is one of the most remarkable structures in the city. The figure of London is very irregular, being stretched out in building at the pleasure of every one, for convenience of trade, or otherwise; whereas Rome was round, with very few irregularities. Its form, however, including the city of Westminster and borough of Southwark, is nearly oblong, being about five miles in length from W. to E. if measured in a direct line from Hyde-park-corner to the end of Limehouse, and upwards of six, if the streets be followed; or from Limehouse to the end of Tothill-street in Westminster, seven miles and a half. London, including the buildings on both sides the water, is in some places three miles broad from S. to N. as from St. George's in Southwark to Shoreditch in Middlesex; or two miles, as from Peterborough-house to Montague-house in Great Russell-street; and in some places not half a mile, as in Wapping; and less in Rotherhithe. Several villages, formerly standing at a great distance, are now joined to the streets by continued buildings, and more making haste to meet in like manner, as at Deptford, Islington, Mile-end, and Newington-butts in Surry. But the act of parliament obtained by

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by the city of London, 1760, for widening its passages, and pulling down its crowded gates, and laying it more open in many places, has put a stop to the rapid progress of buildings in the extreme parts of the town; since the city is now as healthy to live in as any of the outskirts, and equally commodious, and is not liable to such dreadful conflagrations as have happened within these few years from too much crowding. Besides, Westminster is in a fair way to join hands with Chelsea, as St. Giles's is with Marybone, and Great Russell-street by Montague-house with Tottenham-court. The circuit of this large mass, as taken collectively, as consisting of the cities of London and Westminster, and by actual admeasurement in straight lines, may on the Middlesex and Southwark sides amount to upwards of thirty-six miles, exclusive of Greenwich, Chelsea, Knightbridge, and Kensington. The number of inhabitants have been variously guessed at: Maitland in 1739 computes, that within the walls and bars of the city are 725,903; but Sir William Petty, at his last computation, supposed it to contain a million; though in this he takes in a greater compass, sure, than Maitland. This city is under excellent regulations, particularly with regard to beggars, lights, pavements, &c. It is governed by a Lord Mayor, twenty-five aldermen besides the Lord Mayor, two sheriffs, the recorder, and common council; their jurisdiction being confined to the city and its liberties, as also to Southwark. They are conservators of the river Thames, from Staines bridge in Surry and Middlesex to the river Medway in Kent; and some say up to Rochester bridge. The government of the out-parts is by justices and the sheriffs of London, who are likewise sheriffs of Middlesex. The city rises gradually from the Thames bank, and stands on a gentle eminence; but the S. E. and S. W. parts of the town, particularly that part on the south side of the river, stands low, and at spring-tides is subject to inundations, which have sometimes happened at Westminster-hall. The streets are generally level, and the principal ones open and extremely well built, the houses being generally of brick, and extending a considerable length. These are chiefly inhabited by tradesmen, whose houses and shops make a much better appearance than commonly those do in any other city in Europe. Persons of rank mostly reside in large elegant

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squares, some houses in which are of hewn stone, or a composition in imitation of it equally hard and durable, and generally make a grand appearance. Of these are great numbers at the West end of the town; as also that magnificent pile of buildings called the *Adephi*, which, with other particulars, will more properly come under the title *Westminster*. What adds most to the affluence and splendor of this great city, is its commodious port, though near forty miles from the main sea, whither many ships of burden annually resort from all parts of the world; and those of a moderate bulk can come up as far as London bridge, though the very largest are still lower down in the river, while large barges and west-country boats can go through bridge, and at a great distance up the Thames, carrying goods of all kinds to and from the metropolis. London is reckoned to have two-thirds of the whole trade in England. The strength of this city, having no sort of fortifications, unless we reckon the Tower of London as its citadel, consists in the number of its inhabitants, who are commonly computed to be one seventh of all the people in England, and one eighth of the whole people in Great Britain. Here is one cathedral, two collegiate churches, three choirs of music, 146 parishes, 74 chapels for the established church, 28 foreign churches, besides dissenters meeting-houses of all persuasions, nearly equal to the number of established churches (reckoned 128) several popish chapels, two Jewish synagogues, 15 hospitals, three colleges, 13 public prisons, eight public seminaries or free-schools, 131 charity-schools in London and Westminster and ten miles round, 15 markets for flesh, one for live cattle, two herb markets, 23 other markets, 15 inns of court for the study of the law, 27 squares, besides those within any single building, as the Temple, Somerset-house, &c. three public bridges, a town-house or Guildhall, a Royal Exchange, a Custom-house, three artillery-grounds, four pest-houses, and three royal palaces, St. James's, Somerset, and Whitehall. The usual firing in this city, wood being scarce and dear, and that mostly used by the bakers, is pit-coal, brought from Newcastle upon Tyne, and the bishopric of Durham, with some Scotch coals, all of which, at least 800,000 chaldrons, are annually consumed; whence the town always appears at a distance shrouded in smoke.

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The town is well supplied with water from the Thames, the New-river, brought from Ware in Hertfordshire, and the springs at Hampstead. London annually consumes above 700,000 sheep and lambs, and 100,000 head of cattle, besides a vast number of hogs, pigs, poultry of all kinds, &c. &c. In the streets ply daily 1000 hackney-coaches, besides a great number of sedan chairs. The penny-post, for carrying of letters or small paper parcels within the bills of mortality, or ten miles round London every way, is a great convenience. Here is a Royal Society, founded by king Charles II. who hold their meetings under a president at their house in Crane-court, Fleet-street, where is an observatory, library, and museum: and 1751 a society of Antiquarians obtained a charter. The public places for amusement in this city are numerous; as in summer, Ranelagh, Vauxhall, Marybone-gardens, and Sadler's Wells, also St. James's and Hyde-parks, with a great variety of others of less note; and in winter are plays, operas, balls, concerts, the Pantheon, &c. London consists of seventy-two companies, each of which has a master and wardens, or assistants annually chosen. The city is divided into twenty-six wards, and over each presides an alderman, who has his deputy; and out of the court of aldermen is annually chosen a lord mayor, who resides during his mayoralty in an elegant and spacious structure, finished in 1751, and called the Mansion-house; but its not having a sufficient opening round it, great part of its beauty is lost to the eye. London sends four members to parliament; has an old bridge of hewn stone, consisting of 19 arches, which was 33 years in building, and finished in 1209; the houses upon which are pulled down in order to widen the way for foot passengers and carriages, and some of the middle arches enlarged for barges, &c. and is now a great disgrace to the city, from the many accidents which almost daily happen to those whose business requires their going through. It is to be hoped for the sake of humanity, some leading men in the committee will exert themselves, and endeavour to get this dangerous nuisance removed, and rebuilt after the manner of those elegant pieces of architecture, Westminster and Black-friars bridges. In the Tower of London, which is a mile in circuit, and a citadel, are kept the records and state prisoners. It has an arsenal, with arms for 60,000

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men: here are also the crown, jewels, a mint, &c. Not far off is the Custom-house, a very spacious building; and near the foot of London bridge is the Monument of the fire of London, mentioned before, September 2, 1666, being a fluted pillar of hewn stone, 274 feet high to the cupola, with stairs in the inside leading up to the balcony. The Royal Exchange in Cornhill is a grand building, with the statues of all the kings from Edward I. down to the present time, a very few only excepted, which are arranged in niches round the inner area on high. Near these is the Royal Bank of England, which is thought to have four millions sterling in specie; but this is a secret which I believe few are let into. The bank of England began to be erected 1732, and has been lately improved by noble additional buildings in the most elegant taste. The church of St. Stephen Walbrook, near the Mansion-house is reckoned a master-piece of architecture. The General Post-office in Lombard-street is a large commodious place. The town-house, or Guildhall, is a piece of ancient architecture. St. Mary le Bow in Cheapside has a very elegant tower or steeple; as also St. Bride's near Fleet-ditch; but the most elegant is that of St. Leonard's Shoreditch. The cathedral of St. Paul stands on the highest part of the town, and may be seen at a great distance. It is a very grand structure, built in imitation of St. Peter's church at Rome, by the famous architect Sir Christopher Wren. It is 500 feet long, 250 broad in front, 340 high to the cross at the top, has 500 steps to go up to the gallery on the outside, 100 feet the diameter of the cupola or dome, in which is a curious whispering gallery, and 145 on the outside, being covered with lead, and the inside very elegantly painted by Sir James Thornhill. Doctors Commons is not far from St. Paul's, and is a spacious commodious structure, with several handsome courts, where the judges of admiralty, court of delegates, court of arches, &c. meet. Near it is the Heralds office, to which belong three kings at arms, namely, Garter, Clarencieux, and Norroy, with six heralds, four pursuivants, and eight proctors. It is a spacious building, with convenient apartments, a good library relating to heraldry, and the coats of arms are kept of all the families of note in England. To the S. W. of St. Paul's is Black-friars bridge, already mentioned, which is built according to a plan drawn by

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by Mr. Robert Mylne, and the first stone of it laid by Sir Thomas Chitty, then lord mayor. The arches, which are only nine in number, are elliptical, and the centre arch one hundred feet wide. Those on the sides decreasing in width in a regular gradation, and the arch next the abutment at each end is seventy feet wide. It has an open balustrade at the top, and a foot-way on each side, with room for three carriages a-breast in the middle. There are also recesses on the sides for the foot-passengers, each supported by two lofty Ionic columns. This structure appears extremely light and elegant, all the arches being very large, and that of the centre already mentioned is exceeded by few in the world, it being considerably wider than that of the Rialto at Venice. The sessions-house is in the Old Bailey, where they hear and determine criminal causes eight times a-year. An elegant new sessions-house is just finished, and the old one is speedily to be pulled down, in order to make room for the prison now building instead of Newgate. The college of physicians in Warwick-lane is a fine structure, but in a crowded situation. Temple-bar, the next gate to the city of Westminster, is the finest in London, and of modern structure, but has nothing striking unless it be the heads of state-prisoners, which are commonly stuck upon it. The Temple, now an inn for lawyers, formerly belonged to the knights of Jerusalem, or knights-templars. The Temple church is reckoned the best remains of Gothic architecture in London, where may be seen some ancient figures of the knights-templars in their armour lying along. With regard to the other curiosities, see *Westminster*. London lies about 320 miles S. of Edinburgh, 202 N. W. of Paris, 186 W. of Amsterdam, 520 S. W. of Copenhagen, 613 N. W. of Vienna, 264 S. E. of Dublin, 865 N. E. of Madrid, 841 N. W. of Rome, and 1389 N. W. of Constantinople. Lat. 51 deg. 32 min. N. and under the first meridian of our English maps.

LONGEVITY, from *longus*, long, and *vita*, life, length of life. We have several instances of longevity, as Parr, who lived one hundred and thirty-two years and nine months; Henry Jenkins, of Yorkshire, who lived one hundred and sixty-nine; the countess of Desmond and Mr. Ecclestone, both of Ireland, each of whom exceeded 140 years.

LONG-BOAT, in the marine, the largest and strongest boat in the ship. The use of the long-boat is to carry great

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bins, such as water, provisions, anchors, and cables, and often part of the cargo: she is occasionally equipped with a mast, sails, and rigging, sometimes armed with swivels, musketoons, and carabines, and can be decked as necessity requires.

LONGIMETRY, the art of measuring lengths, accessible and inaccessible.

* **LONGINUS (DIONYSIUS)** a celebrated Greek critic of the third century. His father's name is unknown, but by his mother he was allied to the celebrated Plutarch. His youth was spent in travelling with his parents, which gave him an opportunity to increase his knowledge and improve his mind. After his travels he fixed his residence at Athens, and with the greatest assiduity applied to study. Here he published his *Treatise on the Sublime*, which raised his reputation to such a height, and gave the Athenians such an opinion of his judgment and taste, that they made him sovereign judge of all authors, and every thing was received and rejected by the public according to his decisions. He seems to have staid at Athens a long time; here he taught the academic philosophy, and among others had the famous Porphyry for his pupil. But it was at length his fortune to be drawn from Athens, and to mix in more active scenes; to train up young princes to virtue and glory; to guide the busy passions of the great to noble objects; to struggle for, and at last to die in the cause of liberty. Zenobia, queen of the East, prevailed on him to undertake the education of her sons; and he soon gained an uncommon share in her esteem; she spent the vacant hours of her life in his conversation, and modelled her sentiments and conduct by his instructions. That princess was at war with Aurelian, and being defeated by him near Antioch, was compelled to shut herself up in Palmyra, her capital city. The emperor wrote her a letter, in which he ordered her to surrender, to which she returned an answer drawn up by Longinus, which filled him with resentment. The emperor laid siege to the city, and the Palmyrians were at length obliged to open their gates, and receive the conqueror. The queen and Longinus endeavoured to fly into Persia, but were unhappily overtaken and made prisoners when they were on the point of crossing the Euphrates. The queen, intimidated, weakly laid the blame of vindicating the liberty of her country on its true author, and the brave Longinus was basely carried away to immediate execution, amidst the generous condolence of those

those who knew his merit. He pitied Zenobia, and comforted his friends, looking upon death as a blessing, since it rescued his body from slavery, and gave his soul the most desirable freedom. "This world," said he, with his expiring breath, "is nothing but a prison; happy, therefore, is he who gets soonest out of it, and gains his liberty."

The writings of Longinus were very numerous, some on philosophical, but the greatest part on critical subjects; none of which, except that of the Sublime, is extant. Zozimus praises highly Longinus's erudition, his writings, and his fortitude, in suffering death; and Eunapius says that he was a living library.

LONGESIMUS DORSI, in anatomy, a very complex, long and narrow muscle, situated between the spinal apophyses and the sacro-lumbaris from which it is divided by a fatty or cellular line; but at the lower part they are confounded together. The longissimus dorsi is an assistant to the sacro-lumbaris, especially its vertebral portion, which it helps very powerfully, both by the multiplicity and insertions of its fibres, in sustaining the vertebræ of the back and loins, while extended, whether in sitting or standing, and in preventing their sinking under the weight of the body, or any additional burden. It assists in performing or counterbalancing all the motions and inflections which these vertebræ, especially those of the loins, are capable of in all postures of the body. And in this it also bears some resemblance to the inferior or vertebral portion of the splenius: and these two muscles on each side, and the sacro lumbaris, are of the number of those called *vertebrales obliquæ divergentes*. *Winflow's Anat.*

LONGITUDE of the Earth, denotes its extent from west to east, according to the direction of the equator.

LONGITUDE of a Star, &c. in astronomy, an arch of the ecliptic, counted from the beginning of Aries to the place where a star's circle of longitude cuts the ecliptic.

LONGITUDE of a Place, in geography, its distance from some first meridian, or an arch of the equator intercepted between the meridian of the place and the first meridian.

LONGITUDE, in navigation, the distance of a ship or place, east or west, from one another, counted in degrees of the equator. If this distance be counted

in leagues, miles, &c. or in degrees of the meridian, and not in those proper to the parallel of latitude, it is usually called departure. Since the difference of longitude between any two places is equal to the arch of the equator intercepted between the two meridians passing through the two places; which is analogous to the quantity of time that the sun requires to move from the meridian of one place to that of another; or, in the language of the Copernicans, that is elapsed between the application of the meridian of one of the places to the sun and the meridian of the other; for since the sun finishes his diurnal revolution in the space of 24 hours, or, which is the same thing, since the revolution of the earth about her axis is performed in the same time, it follows that in every hour there passes over the meridian one twenty-fourth part of 360 degrees, or of the whole circumference of the equator, equal to fifteen degrees; in two hours, one twelfth part, or thirty degrees; and in any greater or lesser part of time, a proportional greater or lesser part of the equator; whence it follows, that if the difference of longitude, or arch of the equator intercepted between the meridians passing through any two places, be known, the difference of the times of the day in those two places is known also; and consequently, the hour in one place being known, the hour in the other place is known also; and, on the contrary, if the difference between the times at any two places be known, the difference of longitude between those two places is known also, by reducing the difference of the times into degrees and minutes, allowing fifteen degrees to an hour, &c. Hence it is, that if two or more places lie under the same meridian, the hour in one will be the same with the hour in the other; and, on the contrary, if in two or more places the hour be the same, those places lie under the same meridian. And, because the sun in all places constantly rises in the east, he must necessarily apply himself to the meridian of the easternmost place first, and, consequently, in that place that lies to the easternmost, the noon happens soonest; and the hour of the day or distance of the sun from the meridian at any other time must be greatest. Whence it appears, that if by any contrivance whatsoever, the hour of the day at the same point of absolute time in two different places can be obtained, the difference of longitude between those

places is also known; and by comparing the times together, it is easy to pronounce which place of the two lies to the eastward or westward of the other. Wherefore if two or more persons can view the same appearance at two or more places, and pronounce the time at each place when such appearance was visible; or if the time when any notable appearance shall happen at any place be predicted, and the time when that appearance was visible at any other place was determined; these times being compared together, will give the difference of meridians, or difference of longitude between the two places. Now since an eclipse of the moon proceeds from nothing else but an interception of the earth between her and the sun, by which means she is prevented from reflecting the light she receives from the sun, the moment that any part of her body begins to be deprived of the solar rays, it is visible to all those people who can see her at the same time; whence if two or more different people, at two or more different places, observe the times when it first began or ended, or note the time when any number of digits was eclipsed, or when the shadow begins to cover or quit any remarkable spot, the difference of those times, if there be any, when compared together, will give the difference of longitude between the places of observation. The longitudes of places may also be determined from the observations of solar eclipses; but these being incumbered with the considerations of parallaxes, are not near so proper as those of the moon are; and each of these happening but rarely, another excellent expedient has been thought of, and that is the eclipses of Jupiter's satellites. Jupiter has been found to have four satellites or moons constantly attending him, always observing the same laws in moving round about him. See the article *Jupiter*.

Now as neither Jupiter nor any of his attendants have any native light of their own, but shine with a borrowed light from the sun, it happens that each of these, in every revolution about Jupiter, suffers two eclipses, one at their entrance into the shadow, the other at the entrance of their passage behind his body; whence in each revolution of the satellite there are four remarkable appearances, by the observation of any one of which the business may be done, viz one at the entrance into the shadow, and one at the emergence out of it; one at the entrance behind the body, and another at the

coming out; but the latter of these, viz. the ingress and egress of the satellite, into and from under the body, is not so much regarded by astronomers as the immersion into and out of the shadow, because, in the former, the difficulty of pronouncing the exact time is very great, it requiring, in each observer, eyes equally good and strong, and telescopes equally large; but the observation of the former of these viz. the immersion into, and emergence out of the shadow, is easy and practicable, because the quick motions of the satellites plunge them so quick into the shadow of Jupiter, that it is no difficult matter to pronounce, by any telescope, by which they may be seen, the exact time of their immersion, and emergence, as any one may soon be satisfied, if he will but try the experiment.

Now, inasmuch as each of these happens at the same moment of absolute time, if two or more persons, in different places, note the time of observation, these, when compared together, will give the difference of longitude between the two places of observation. And, when we consider the great number of these eclipses that happen every year, there being more visible in one year than there are days in it, and, consequently, but few nights when Jupiter may be seen, and which is near eleven months of the year, but that an eclipse of one or other happens, and sometimes two or three in a night; the easiness with which they may be made, there requiring only a telescope of eight or ten feet in length, which may be almost managed with the hand; and the little likelihood there is of missing the times of ingress or egress, they being in a manner momentaneous; and lastly, the great exactness to which they would give the difference of longitude, it being certainly as exact as the latitude can at present be taken; it is much to be wondered at, that the more skilful part of our seamen have so long neglected them, and especially in the several ports into which they sail.

Besides these, there is another method equally useful, expeditious, and certain; and that is, the appulses of the moon to certain fixed stars, and their occultations by the interposition of her body; for, the moon finishing her revolution in the space of twenty-seven days, seven hours, forty-three minutes, there are but few clear nights, when the moon does not pass over, or so near to some fixed star, that her distance from it, or the time of her visible

visible conjunction with it, may be easily observed by the telescope and micrometer only; and these when compared together, or with the visible time computed to the meridian of some place when a good theory of the moon shall be obtained, will shew the difference of longitude of those places.

In the Philosophical Transactions, N^o 1, we have an account of a successful experiment made with two pendulum-watches by major Holmes, in a voyage from the coast of Guinea homewards. This and some other successes encouraged monsieur Huygens so far, that, after he had improved the structure of these watches, he published an account at large for the shewing how and in what manner these watches are to be used in finding the longitude at sea, with directions for adjusting of them and keeping a journal by them; which account the curious reader may see at large in the Philosophical Transactions, N^o 47.

This method has been pursued by the ingenious Mr. John Harrison, who, after many years labour, has at last completed a time-keeper, which has almost every requisite necessary for finding the longitude at sea; and from several experiments, particularly two voyages to the West Indies, it was found to keep time so very accurately as not to vary above a minute in the whole voyage.

LONGITUDINAL, in general, denotes something placed lengthwise: thus some of the fibres of the vessels in the human body are placed longitudinally, others transversely, or across.

LONICERA, honey-suckle, in botany.

LOOF, in ship-building, that part of a ship where the bow begins, or where the planks of her fore part begin to bend, and round inward, as she grows narrower approaching the stem.

LOOKING-GLASSES are nothing but plane mirrors of glass; which being impervious to the light, reflect the images of things placed before them; for the theory of which see the articles *Mirror* and *Reflection*.

For the casting, grinding, and polishing glasses, see *Glass*.

For foliating of looking-glasses, see the article *Foliating*.

LOOM, a frame composed of a variety of parts, used in all the branches of weaving; for a particular description of which, see *Weaving*.

LOPPING, among gardeners, the cutting off the side-branches of trees.

The lopping of young trees, that is, of such as are ten or twelve years old, will preserve them much longer, and will occasion the shoots to grow more into wood in one year, than they do in old tops in two or three. The taking off of large boughs in a careless manner destroys many a tree; they should therefore always be lopped with great care, and the wound covered with some loam to keep it from rotting, and prevent the wet from entering and getting into the body of the trees. All sorts of resinous trees, or such as abound with a milky juice, should be lopped but very sparingly, for they are very subject to decay, when cut. The best season for the lopping these is the end of August, when they will not bleed very much, and the wounds will heal before the hard weather. The generality of the world are against pruning timber trees at all, and, where they naturally grow straight and regular, it is much better let alone. But all common faults in shape may be regulated by thus lopping them while young, and it can be attended with no ill consequence to the timber; for the cut not lying near the timber pith cannot affect it, when grown up, and squared in the working for beams and other uses, or to be quartered; for all the defects occasioned by such wounds, are in the superficial parts, and all the four quarters are perfectly sound within. As to the large forest trees, they should not be lopped at all, except in cases of great necessity, and then the large boughs must not be cut, but only the side branches, and even these must be cut off close, that the bark may soon cover the wound, and yet a little slanting, that the water may run off, not lodge upon the cut part. If there is a necessity of cutting off a large bough, as by its being broken or cankered, let it be cut off slanting at about four feet distance from the body of the tree, and that if possible near some place where there is a young shoot from it, which may receive the sap, and grow up in its place. No stump must be left standing out farther than this, because they are wounded parts which never can heal, and which will always be letting in the water, and will serve as pipes to convey that water into the heart of the body of the tree, and by degrees will utterly spoil it. All that grow upright, whether they be large or

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small branches, must in cutting be taken off slanting, never evenly, for the same reason; those boughs that bear from the head are to be cut with the slope on the lower side, and on any occasion that great wounds are given to a tree, they should be covered with a mixture of clay and horse-dung, which will make them heal much sooner than they otherwise would do. *Martimer's Husbandry.*

LORD, a title of honour, given to those who are noble, either by birth or creation; in this sense it amounts to much the same as peer of the realm, or lord of parliament. This title, by the courtesy of England, is also given to all the sons of dukes and marquises, and to the eldest sons of earls; and it is also a title of honour bestowed on those who are honourable by their employments, as lord advocate, lord chamberlain, lord chancellor, &c.

LORICATION, COATING, in chemistry, is the covering a glass or earthen vessel with a coat or crust of a matter able to resist the heat, to prevent its breaking in the performing an operation that requires great violence of fire. When vessels are exposed naked to the greatest fire, it easily happens that they burst by throwing fresh cold fuel into the fire, for the preventing of which, the operator must have recourse to lorication, or coating.

LOTION, *Loto*, washing, in physic, a sort of medicine compounded of liquid ingredients for beautifying the face, and cleansing it from any deformity which the blood throws out. It also denotes a medicine that holds a medium between a fomentation and a bath.

LOTUS, the square podded vetch, in botany, a genus of plants.

LOVAGE, in botany, the English name for the ligusticum. See *Ligusticum*.

LOVE-APPLE, the fruit of a species of solanum, a plant cultivated in gardens among us for the singularity of its appearance; the Portuguese eat this fruit either raw or stewed, as do also the few families in England.

LOUIS, or *Knight of St Louis*, the name of a military order in France instituted by Louis XIV. in 1693. Their collars are of a flame colour, and pass from left to right; the king is their grand master.

LOUSE, *Pediculus*, in zoology.

LOWERING, among distillers, a term used to express the debasing the strength of any spirituous liquor by mix-

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ing water with it. The standard and marketable price of these liquors is fixed, in regard to a certain strength in them called proof; this is that strength, which makes them, when shook in a phial, or poured from on high into a glass, retain a froth or crown of bubbles for some time. In this state spirits consist of about half pure, or totally inflammable spirits, and half water; and if any foreign or home spirit is to be exposed to sale, and is found to have that proof wanting, scarce any one will buy it, till it has been distilled again, and brought to that strength; and if it be above that strength, the proprietor usually adds water to it to bring it down to that standard. This addition of water, to debase its strength, is what is called lowering it. People well acquainted with the goods will indeed buy spirits at any strength, only lowering a sample to the proof strength, and by that judging of the strength of the whole; but the generality of buyers will not enter into this, but must have it all lowered for them. There is another kind of lowering in practice among the retailers of spirituous liquors to the vulgar: this is the reducing it under the standard of proof. They buy it proof, and afterwards increase their profit upon it, by lowering it with water one eighth part. The quantity of spirit is what they generally allow themselves for the addition of water; and whoever has the art of doing this, without destroying the bubble proof, as this is easily done by means of some addition, that gives a greater tenacity to the parts of the spirit, will deceive all that judge by this proof alone; that is, very nearly all who are concerned in the spirit trade. Such an additional quantity of water, as one eighth, makes the spirit taste softer and cooler, and will make many prefer it to the stronger spirit, which is hotter and more fiery; but unless the spirit, thus lowered, were tolerably clean, or the proof be some other way preserved, the addition of the water lets loose some of the coarse oil, which makes the liquor milky, and leaves a very nauseous taste in the mouth. *Steu's Essay on Distillery.*

LOXIA, in the Linnæan system of zoology, the name of a genus of birds of the order of the passeres, the distinguishing characters of which are, that the tongue is plain, equal, and whole; the beak large, thick, and short, and crooked and convex both ways.

LOZENGE,

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LOZENGE, LOZANGF, *Rhombus*, in geometry, a quadrilateral figure, consisting of four equal and parallel sides, two of whose opposite angles are acute, and the other two obtuse; the distance between the two obtuse ones being always equal to the length of one side: when the sides are unequal, this figure is called a rhomboides. Scaliger derives the word from the Latin *laurengia*, as this figure somewhat resembles that of a laurel leaf.

LOZENGE, in heraldry, a rhombus, or figure of equal sides, but unequal angles, resembling a quarry of glass in our old windows, placed erect, pointwise. It is in this figure that all unmarried gentlewomen and widows bear their coats of arms; because, as some say, it was the figure of the Amazonian shield; or, as others, because it is the ancient figure of the spindle.

LOZENGE, in pharmacy, the same with what is otherwise called troche.

LUCERNE, in botany, &c. a plant frequently cultivated in the manner of clover, and known among authors by the names of medica and medicago. It is the alfafa of the Spaniards, and the lucerne, grand trefle, or fenum Burgundiacum, as some botanists call it, of the French. It has a perennial root, and an annual stalk, which rises full three feet high in good land, and is garnished at each point with trifoliate leaves, whose lobes are spear-shaped, about an inch and a half long, and half an inch broad, sawed towards the stalks. The flowers grow in spikes, which are from two to near three inches in length, standing upon naked foot stalks two inches long, rising from the wings of the stalks: they are of the pea bloom, or butterfly, kind; of a fine purple colour, and are succeeded by compressed moon-shaped pods, which contain several kidney-shaped seeds. It flowers in June, and its seed ripens in September.

There are the following varieties of this species of lucerne, viz. one with violet-coloured flowers; another with yellow flowers; a third with yellow and violet flowers mixed; and a fourth with variegated flowers: but, as Mr. Miller observes, these are only variations of the same plant, arising accidentally from the seed. However, neither the yellow, nor the variegated, flowered lucerne, is ever so strong as that with purple flowers, nor is it, consequently, so profitable to the husbandman.

Columella calls this the choicest of all

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fodder, because it will last ten years, and will bear being cut down four, and sometimes six times in a year; it enriches the land on which it grows, fattens the cattle fed with it, and is a remedy for sick cattle. About three quarters of an acre of it is abundantly sufficient to feed three horses during the whole year. Yet notwithstanding it was so much esteemed by the ancients, and hath been cultivated to great advantage in France and Switzerland for many years, it has not yet found so good a reception in England as it justly deserves; nor is it cultivated here in any considerable quantity, though it will succeed as well in this country as in either of the last mentioned; being extremely hardy, and resisting the severest cold of our climate.

The soil in which this plant is found to succeed best in this country, is a light, dry, loose, sandy land, which should be well ploughed and dressed, and the roots of all noxious weeds, such as couch grass, &c. destroyed; otherwise these will over-grow the plants while young, and prevent their progress.

The best time to sow the seed is about the middle of April, when the weather is settled and fair; for if you sow it when the ground is very wet, or in a rainy season, the seeds will burst and come to nothing, as is often the case with several of the leguminous plants; therefore you should always observe to sow it in a dry season, and if there happens some rain in about a week or ten days after it is sown, the plants will soon appear above ground.

After having well ploughed and harrowed the land very fine, you should make a drill quite across the ground, almost half an inch deep, into which the seeds should be scattered very thin: then cover them over a quarter of an inch thick, or somewhat more, with the earth: then proceed to make another drill, about a foot and a half from the former, sowing the seeds therein in the same manner as before, and so proceed through the whole spot of ground, allowing the same distance between row and row, and scatter the seeds very thin in the drills. In this manner, an acre of land will require about six pounds of seed: for when it is sown thicker, if the seeds grow well, the plants will be so close as to spoil each other in a year or two, the heads of them growing to a considerable size, as will also the roots, provided they have room; for the crown of some will measure eighteen inches diameter; from which near four hundred

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hundred shoots have been cut at one time, which is an extraordinary increase, and this upon a poor dry gravelly soil, which had not been dunged for many years, but the roots were at least ten years old; so that if this crop be well cultivated, it will continue many years, and be equally good as when it was first sown: for the roots generally run down very deep in the ground, provided the soil be dry; and although they should meet a hard gravel a foot below the surface, yet their roots would penetrate it and make their way downward, some of them having been taken up, which were above a yard in length, and had run two feet into a rock of gravel, so hard as not to be loosened without mattocks, and crows of iron, and that with much difficulty.

The reason for directing this seed to be sown in rows is, that the plants may have room to grow; and for the better stirring the ground between them, to destroy the weeds, and encourage the growth of the plants, which may be very easily effected with a Dutch hoe, just after the cutting the crop each time, which will cause the plants to shoot again in a very little time, and be much stronger than in such places where the ground cannot be stirred: but when the plants first come up, the ground between should be hoed with a common hoe; and if in doing of this you cut up the plants where they are too thick, it will cause the remaining to be much stronger. This hoeing should be repeated two or three times while the plants are young, according as the weeds are produced, observing always to do it in dry weather, that the weeds may the better be destroyed; for if it be done in moist weather, they will root and grow again.

With this management, the plants will grow to the height of two feet, or more, by the beginning of August, when the flowers will begin to appear, at which time the lucerne should be cut, observing to do it in a dry season, if it is to be made hay, and keep it often turned, that it may soon dry, and be carried off the ground; for if it lie long upon the roots, it will prevent their shooting again. After the crop is taken off, you should stir the ground between the rows with a hoe, to kill the weeds, and loosen the surface, which will cause the plants to shoot out again in a short time, so that by the beginning of September there will be shoots four or five inches high, when you may turn in sheep upon it to feed it

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down: nor should the shoots be suffered to remain upon the plants, which would decay when the frosty weather comes on, and fall down upon the crown of the roots, and prevent their shooting early the succeeding spring.

The best way therefore is to feed it until November, when it will have done shooting for that season: but it should not be fed by large cattle the first year, because the roots being young, would be in danger of being destroyed, either by their trampling upon them, or their pulling them out of the ground: but sheep will be of service to the roots by dunging the ground, provided they do not eat it too close, so as to endanger the crown of the roots.

In the beginning of February, the ground between the rows should be again stirred with the hoe, to encourage them to shoot again: but in doing this you should be careful not to injure the crown of the roots, upon which the buds are at that time very turgid, and ready to push. With this management, if the soil be warm, by the middle of March the shoots will be five or six inches high, when, if you are in want of fodder, you may feed it down till a week in April; after which it should be suffered to grow for a crop, which will be fit to cut the beginning of June, when you should observe to get it off the ground as soon as possible, and stir the ground again with the Dutch hoe, which will forward the plants shooting again; so that by the middle, or latter end of July, there will be another crop fit to cut, which must be managed as before; after which it should be fed down again in autumn: and as the roots by this time will have taken deep hold in the ground, there will be little danger of hurting them, if you should turn in larger cattle; but you must always observe not to suffer them to remain after the roots have done shooting, lest they should eat down the crown of the roots below the buds, which would considerably damage, if not destroy them.

In this manner you may continue constantly to have two crops to cut, and two seedings upon this plant; and in good seasons there may be three crops cut, and two seedings, which will be a great improvement, especially as this plant will grow upon dry barren soils, where grass will come to little, and will be of great use in dry summers, when grass is often burnt up: and as it is an early plant in the spring, so it will be of great service

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when fodder falls short at that season, when it will be fit to feed at least a month before grass or clover; for this plant is often eight inches high by the middle of March, at which time the grass in the same place is scarcely one inch high.

Cold will not injure this plant; for in the very cold winter, 1728-9, some roots of this plant which were dug up in October, and laid upon the ground in the open air till the beginning of March, were again planted, and they shot out very vigorously soon after: nay, even while they lay upon the ground, they struck out fibres from the under side of the roots, and had begun to shoot green from the crown of the roots; but wet will altogether destroy the roots; for a little of the seed being sown upon a moist spot of ground for a trial, it came up very well and flourished exceedingly during the summer season; but in winter, when the great rains fell, the roots began to rot at bottom; and before the spring most of them were destroyed.

The best places to procure the seed from, are Switzerland and the northern parts of France, which succeeds better with us than that which comes from a more southern climate: but this seed may be saved in England in great plenty; in order to which, a small quantity of the plants should be suffered to grow uncut till the seeds are ripe, when it must be cut, and laid to dry in an open barn, where the air may freely pass through: but the seed must be defended from the wet; for if it be exposed thereto, it will shoot while it remains in the pod, whereby it will be spoiled. When it is quite dry, it must be threshed out, and cleansed from the husk, and preserved in a dry place till the season for sowing it: and this seed saved in England is much preferable to any brought from abroad; the plants produced from it being much stronger than those produced from the French, Helvetian, and Turkey seeds, which are sown at the same time, and on the same soil and situation.

* LUCIAN, a celebrated Greek author, in the first century, was born at Samosata, of obscure parents, under the reign of the emperor Trajan. His father resolved to make him a sculptor, and put him apprentice to his sister's husband; but Lucian being used ill by his uncle for breaking a table he was endeavouring to polish, became disgusted with that art, and applied himself solely to polite literature and philosophy, to which his taste led

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him. Afterwards he became an advocate, but the wranglings of the bar being disagreeable to him, he engaged in the profession of a rhetorician. He studied first at Antioch, whence he passed into Ionia, then into Gaul and Italy, and returned into his own country through Macedonia. Marcus Aurelius, being informed of his merit, made him superintendent of Egypt. Lucian died under the reign of that prince, aged ninety; and, according to Suidas, was torn in pieces by dogs. There are still extant his Dialogues, and other works, well written in Greek, in which he has joined the useful to the agreeable, instruction to satire, and erudition to elegance. We every where meet with that fine and delicate raillery which characterises the Attic taste.

LUCID INTERVALS, in lunatics, the times wherein they appear to be in their senses.

LUCIDA, in astronomy, an appellation given to several fixed stars on account of their superior brightness.

LUCIUS, the pike, or jack, in ichthyology, a species of eel, with a depressed rostrum. The pike grows to a considerable size, but usually is found from fourteen inches to two feet in length: it is all over variegated with round yellowish spots. It is a well known and very voracious fish.

* LUCRETIA, a Roman lady, illustrious for her beauty, noble extraction, and virtue, was married to Collatinus, who was related to Tarquin the Proud, king of Rome. While that prince laid siege to the town of Ardea, his son Sextus entertained his two brothers and Collatinus at supper, when the conversation turned on the beauty of their wives, every one asserting that his wife was the handsomest. The dispute growing hot, Collatinus proposed a means of deciding it, by their immediately setting out on horseback, and paying the ladies a visit. Being heated with wine, they eagerly agreed to the proposal, and rode full speed to Rome, where they found Tarquin's daughters-in-law regaling themselves luxuriously with persons of the same age with themselves. They afterwards went to Collatia, and though it was then late, found Lucretia at work with her maids. They all agreed that she exceeded the others, and returned back to the camp. Sextus, inflamed with love, repaired a few days after to Collatia, where he was received by Lucretia with all the politeness

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ness due to a near relation, and the king's eldest son. After supper he was conducted to his bed chamber; but the instant he imagined every one was fast asleep, he went softly, with a drawn sword in his hand, into Lucretia's apartment, where, after threatening to kill her in case she made the least noise, he made a declaration of his passion, and employed the most tender entreaties, as well as the most terrible menaces, but all to no purpose. Lucretia persisting in her constancy and resolution, was even unmoved at the fear of death; but she could not resist his menace of exposing her to the utmost infamy: Sextus declared, that having killed her, he would kill a slave, and then laying him in her bed, spread a report, that having caught them in the act of adultery, he had punished them with death. Having by this means accomplished his infamous design, he withdrew, proud of his conquest; but the lady, plunged in a deep melancholy, sent to intreat her father, who was in Rome, and her husband, who was at the siege of Ardea, to come to her with all speed: they accordingly did so, when she told them her misfortune, and conjured them to revenge her cause: this they promised, and gave her all the consolation in their power; but she was quite inconsolable, and drawing forth a dagger which she had hid under her cloaths, stabbed herself to the heart. Brutus, who saw this spectacle, found the opportunity he so long sought of freeing Rome from Tarquin's tyranny, which he so far improved, that the kingly power was abolished, and the liberty of the Romans restored. Her ravisher was exposed to his own remorse, or the severe reproaches of the family he had ruined; for he retired to the city of Gabii, where he had formerly commanded, and there lost his life soon after.

LUES, among physicians, is, in general, used for a disease of any kind; but, in a more particular sense, is restrained to contagious and pestilential diseases: thus the lues Gallica, or venerea, signifies the venereal disease.

LUFF, amongst sailors, the order from the pilot to guide the ship's head nearer to the direction of the wind, or nearer to that part of the horizon from which the wind bloweth.

She keeps a good LUFF, i. e. holds her way well, without deviating to the leeward of her course.

LUKE, or *Gospel of St. LUKE*, a

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canonical book of the New Testament. Some think it was properly St. Paul's gospel, and that when that apostle speaks of his gospel, he means what is called St. Luke's. Irenæus says, that St. Luke digested into writing what St. Paul preached to the Gentiles: and Gregory Nazianzen tells us, that St. Luke wrote with the assistance of St. Paul. "St. Luke, says a modern writer, is pure, copious, and flowing in his language, and has a wonderful and entertaining variety of select circumstances in his narration of our Saviour's divine actions. He acquaints us with numerous passages of the evangelical history not related by any other evangelist: both in his Gospel and Apostolical Acts, he is accurate and neat, clear and flowing, with a natural and easy grace: his style is admirably accommodated to the design of his history; it had a good deal of resemblance to that of his great master St. Paul; and, like him, he had a learned and liberal education. I believe he had been very conversant with the best classics; for many of his words and expressions are exactly parallel to theirs. *Blackwall's Sacred Classics.*

ST. LUKE the Evangelist's Day, a festival in the Christian church, observed on the 18th of October.

LUMBAGO, in physic, a violent pain in the loins, which affects the patient in such a manner that he can scarcely move. It is a scorbutic symptom, and frequently excited by the gout or rheumatism.

LUMERICAL, a name given to four muscles of the fingers, and to as many of the toes.

* **LUNA**, in pagan worship, one of the names of Diana, who is said to have been called Luna in heaven, and Diana on earth. Others make her a distinct deity, and call her the daughter of Hyperion and Theia. The Egyptians worshipped her both as male and female, the men sacrificing to her as Luna, the women as Lunus, and each sex on those occasions assumed the dress of the other.

LUNA, among chymists, signifies silver.

LUNAR, something belonging to the moon; thus we say, lunar month, lunar year, lunar dial, lunar eclipse, &c.

LUNATIC, a person affected with lunacy, the cure of which is to be attempted by evacuations of all kinds; as bleeding, vomiting, cathartics, &c.

LUNGS, a part of the human body, which

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which is the cause or instrument of respiration. The lungs are the largest viscous of the thorax; they are situated in the two sides of it, with the heart as it were between them; and are connected, by means of the mediastinum, with the sternum and vertebræ; with the heart, by means of the pulmonary vessels, and immediately with the aspera arteria. The colour of the lungs, in infants, is a fine florid red; in adults, it is darker; and in old people, livid, or variegated with black and white. When inflated, they have some resemblance to the hoof of an ox, and are convex on the upper side, and concave underneath. They are divided into two large lobes, the right and left; the left, which is the smaller, is divided again into three smaller ones. The membrane with which the lungs are surrounded is continuous with the pleura. The substance of the lungs is spongy, or vesicular, and they seem, indeed, entirely composed of a number of small vesicles of a fleshy texture, and of a variety of vessels.

The vessels of the lungs are the bronchia, the bronchial artery and vein, the pulmonary artery and vein, the nerves, and the lymphatics.

The uses of the lungs are, 1. To perform the office of respiration, by which the blood is attenuated in the plexus of the arteries called the rete vasculosum. 2. To be assistant to the voice in speaking, and to the sense of smelling. They are also emunctories of the blood, and are of many other important services.

LUNG-WORT, *Pulmonaria*, in botany. See *Pulmonaria*.

LUNISOLAR YEAR, in chronology, a period of years produced by multiplying the cycle of the moon, 19, by 28, that of the sun; the product is 532; in which space of time these luminaries return to the same point in the heavens.

LUNULA, in geometry, a plane figure like a crescent, or half-moon, for the quadrature of which, see *Quadrature*.

LUPERCALIA, in antiquity, a festival of the ancient Romans in honour of the god Pan, observed on the 15th of February, and so called from the luperi, the priests of that fabulous deity.

LUPUS MARINUS, the sea-wolf, in ichthyology. It is a very singular fish, growing to four or five feet long.

LUPUS, in astronomy, a constellation of the southern hemisphere. See *Centaur*.

LURE, in falconry, a device of lead.

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ther, in the form of a bird, with two wings stuck with feathers, and baited with a piece of flesh, wherewith to reclaim or call back a hawk, when at a considerable distance.

LUSTRE, the gloss or brightness appearing on any thing, particularly on manufactures of silk, wool, or stuff. It is likewise used to denote the composition or manner of giving that gloss. The lustre of silks is given them by washing in soap, then clear water, and dipping them in alum-water cold. To give stuffs a beautiful lustre, for every eight pounds of stuff allow a quarter of a pound of linseed; boil it half an hour, and then strain it through a cloth, and let it stand till it is turned almost to a jelly: afterwards put an ounce and a half of gum to dissolve twenty-four hours; then mix the liquor, and put the cloth into this mixture; take it out, dry it in the shade, and press it. If once doing is not sufficient, repeat the operation. Curriers give a lustre to black leather first with juice of barberries, then with gum-arabic, ale, vinegar, and Flanders glue, boiled together. For coloured leather, they use the white of an egg beaten in water. Morroccoes have their lustre from juice of barberries and lemon or orange. For hats, the lustre is frequently given with common water, sometimes a little black dye is added: the same lustre serves for furs, except that for very black furs they sometimes prepare a lustre of galls, copperas, Roman alum, ox's marrow, and other ingredients.

LUSTRUM, in Roman antiquity, a general muster and review of all the citizens and their goods, which was performed by the censors every fifth year, who afterwards made a solemn lustration.

LUTE, or **LUTING**, among chymists, a mixed, tenacious, ductile substance, which grows solid with drying; and when applied to the junctures of vessels for distillation, stops them up. When the subject is merely aqueous, linseed meal, ground fine, and well worked up into a stiff paste with the white of an egg, makes a proper luting: it grows hard with heat, and if it happens to crack, it is repaired by a fresh application. In the distillation of all fermented inflammable spirits and volatile alkaline salts, a paste made of the same meal, well worked up with cold water, answers very well. In the distillation of mild acids or acetous liquors, a bladder steeped in water, till it grows slimy, makes an

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excellent luting. A luting that acquires a stony hardness is necessary in the distillation of fossil acids, as vitriol, sea-salt, &c. which is called the philosophical luting, and may be prepared from the calx of copperas and quick-lime, by boiling the caput mortuum in vitriol, in several parcels of water, till thoroughly washed, then drying the powder, and preserving it in a close vessel. This powder is to be rubbed with an equal quantity of quick-lime, and wrought into a paste with the whites of eggs first beat thin; and this luting is immediately to be applied to the vessel, being first a little heated: or beat pure sand and potter's clay together in such proportion with water, till the matter no longer sticks to the fingers; then add a fourth part of common lime, and the drier this is applied the better, provided it be left ductile, and the cracks are easily stopped up by the same. To coat vessels in the stronger distillations with a naked fire, beat fat potters earth and powdered sand with water into a well-wrought paste, which will not stick to the fingers, adding a little common lime at the last, and beating them together: then, the vessel being exposed to the vapour of hot water, spread the cement all over it equally with the hand, afterwards sprinkle the surface of the coating with hot and dry sand, and let the coat dry slowly in a cool place, minding to fill up the cracks. The London chymists use for the same purpose sifted wood-ashes beat up to a due consistence with the white of eggs and a little gum water. The same service may be performed in a more excellent manner by a mixture of linseed oil and ceruss made by insolation or decoction, and afterwards ground upon a marble with fresh ceruss, till the whole be of the consistence of an unguent.

LUTE is also a musical instrument with strings.

• **LUTHER (MARTIN)** a celebrated reformer, was born at Isleben in Saxony, on the 10th of November 1483. He finished his course of philosophy at Erford, and was made master of arts in 1503, at 20 years of age. One day as he was walking out of that city, he was struck down with lightning; and his companion was killed, which had such an effect upon him, that he resolved to embrace the monastic state; and therefore at 22 years of age entered amongst the Augustines at Erford, and when he was 24 took priest's orders. Some time

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after he was sent to teach philosophy at Wittemberg, where the duke of Saxony had founded an university: he was there much admired; was made doctor and professor of divinity, and acquired great reputation by his lectures and sermons. In 1516 Luther began to apply himself to the study of the Greek and Hebrew languages. In 1517, pope Leo X. having published indulgences, in order to enable him to build the magnificent church of St. Peter at Rome, these were managed in the most scandalous manner. Albert of Brandenburg, archbishop of Mentz and Magdeburg, who had a commission for Germany, gave out this commission to John Icelius, a Dominican friar, and others of his order, who immediately exposed them to sale; and Icelius boasted of "having so extensive a commission from the pope, that though a man had deflowered the Virgin Mary, yet for money he might be pardoned: adding, that he not only granted pardons for sins past, but for those to come." Luther, whose zeal was naturally warm and active, was now unable to contain himself, and therefore publicly fixed upon the church of Wittemberg, next the castle, a thesis upon indulgences, containing 95 propositions, challenging any one to oppose them either by writing or disputation. This piece was no sooner published, than Icelius maintained and published at Francfort a thesis in opposition to it, and animating the clergy of his order against Luther, anathematized him from the pulpit as a most damnable heretic, and publicly burnt his thesis at Francfort. In return, Icelius's thesis was burnt by the Lutherans at Francfort, without Luther's having any hand in it. But he was now attacked by adversaries innumerable from every side; three of the principal of whom were John Echiuss, Sylvester Prierias, and one Jacobus Hogostratus, a preaching friar. In the year 1518, Luther, contrary to the advice of his friends, resolved to shew his obedience to authority, and went to the monastery of Heidelberg, while the chapter was held, and there maintained a dispute concerning justification by faith, which Bucer, who was present, took down in writing. In the mean time the zeal of his adversaries growing daily more active, he was at length accused to Leo X. as a heretic; and therefore, on his return from Heidelberg, he wrote a letter in the most submissive terms to that pope. Meanwhile the

the emperor Maximilian applied to Leo by letter to put a stop to these dangerous disputes, promising that he would strictly execute in the empire whatever his Holiness should enjoin. The pope now gave orders that Luther should be cited to appear at Rome within sixty days, to give an account of his doctrine; and wrote to the elector of Saxony to exhort him to put Luther into the hands of his legate. At the same time he sent a brief to cardinal Cajetan, ordering him to bring Luther before him, denouncing the ordinary punishment of excommunication, interdiction, and privation of goods, against those that should receive Luther, and give him protection, and promising a plenary indulgence to all that should assist in delivering him up. Luther used all possible means to prevent his being carried to Rome, and to obtain a hearing in Germany; and both the university of Wittemberg and the elector of Saxony interceding for him, the pope consented that his cause should be tried before cardinal Cajetan; or which Luther immediately set out for Augsborg, with letters from the elector, and having obtained an assurance of safety, appeared before the cardinal: but finding that he would not be allowed to give reasons, that the legate steadily maintained that the pope alone could decide upon the sense of scripture, unless he brought his recantation with him, he withdrew from Augsborg, but before his departure published a formal appeal to the pope. Luther was a man of invincible courage, and was besides animated by an assurance of protection from Frederic of Saxony; therefore on the legate's writing a letter to that prince, in which he charged Luther with maintaining damnable propositions, and exhorted him either to send him to Rome, or banish him from his dominions, he communicated it to Luther, who immediately drew up a defence of himself; and soon after the elector told the legate, that several able men, both in his own and other universities, did not think Luther's doctrine either impious or heretical; and that as he had not been convicted of heresy, he could neither banish him nor send him to Rome; and that since Luther offered to submit to the judgment of several universities, he thought they ought to hear him, or at least to shew him his errors. On the other hand, Luther not only continued to teach the same doctrines, but sent a challenge to all the inquisitors to come

and dispute with him, offering them not only safe-conduct from his prince, but that they should be well entertained, and have their charges borne while they remained at Wittemberg. While these things passed in Germany, Leo published a brief, by which he declared, "That the pope, the successor of St. Peter, and the vicar of Jesus Christ, had power to pardon the guilt and punishment of sin: and that by indulgences properly obtained, the dead and the living are immediately freed from the punishment due to their actual sins." Upon this Luther published an appeal from the pope to a general council. The pope now endeavoured to gain over the elector of Saxony, by sending to him Militius, his chamberlain, with a golden rose, as a mark of his particular favour; ordering Militius to require the elector to oblige Luther to retract, or deny him his protection: but that reformer having now opened the elector's eyes, Militius received a very cool reception. In the mean time Luther's doctrine spread and prevailed greatly, and he received encouragement at home and abroad. In the year 1519, Luther had a famous dispute at Leipzig with John Eccius, on purgatory, indulgences, and the pope's supremacy; which ended like most others, in the parties being not in the least nearer in point of opinions. The same year Luther's books about indulgences were formally censured by the divines of Louvain and Cologne: and at length, continual importunities of his adversaries induced Leo to publish a formal condemnation of him, by a bull dated the 15th of June 1520. Luther immediately wrote against it in the most severe terms, and then assembling the students at Wittemberg, threw both the pope's bull and decretals into a fire prepared for that purpose. Luther had afterwards the courage to appear in person at the diet at Worms, where he declared, "That unless he was convinced by texts of Scripture, or by reason, he neither could nor would retract any thing, because it was not lawful for him to act against his conscience." The elector of Saxony now foreseeing, that the emperor Charles V. king of Spain, was going to publish a bloody edict against Luther, and that it would be impossible to protect him any longer without bringing himself to trouble, had him seized and secretly carried to the castle of Wittemberg, and soon after the bull was published,

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lished, in which he forbids all persons, under the penalty of high treason, loss of goods, and being put to the ban of the empire, to receive or defend, maintain or protect him or his opinions. But while this bull was thundering throughout the empire, Luther was safely shut up in his castle, which he afterwards called his hermitage and his Patmos, where he held a constant correspondence with his friends at Wittemberg, and employed himself in composing books. But the emperor was no sooner gone into Flanders, than Luther's doctrine spread faster than before. However, Henry VIII. of England, to shew his zeal and his learning, wrote a treatise on the Seven Sacraments, against Luther's book of the Captivity of Babylon, for which Leo complimented him with the title of Defender of the Faith. Luther, after ten months retirement, appeared publicly again, and soon after not only published a German translation of the New Testament, and several other works, but married Catherine de Bora, a nun who had escaped from her confinement. At length the emperor called a diet at Spire, by which a decree was published, enjoining the execution of the edict of Worms; but fourteen cities appealed from this decree; and this was the famous protestation which gave the name of Protestants to the reformers in Germany. In short, Luther's German translation of the bible was first published in the year 1534. He lived to see the opening of the council of Trent, for accommodating the differences in religion, and spared no pains to engage the Protestant princes to oppose that council with vigour. These measures he pursued till his death, which happened at Isleben, on the 18th of February 1546, in the 63d year of his age. Soon after his body was put into a leaden coffin, and carried with funeral pomp to the church at Isleben, when Dr. Jonas preached a funeral sermon upon the occasion. The earls of Mansfeldt desired that his body might be interred in their territories; but the elector of Saxony insisting on his being brought back to Wittemberg, this was done, and he was interred there with the greatest pomp; princes, nobles, and students without number attended the funeral procession, and Melancton made his funeral oration. It is remarkable that the papists invented a thousand lies about his death; some said that he killed himself; others, that he was strangled by the devil; and others, that his corpse

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stunk so abominably, that they were forced to leave it in the way as it was carried to be interred. But while we are giving these instances of the malice of the Papists, we ought not to forget the more generous conduct of Charles V. whose troops being quartered at Wittemberg in 1547, a soldier gave Luther's effigies, in the church of that castle, two stabs with his dagger; and the Spaniards earnestly desired that his tomb might be demolished, and his bones dug up and burnt: but that emperor wisely replied, "I have nothing farther to do with Luther; he has henceforth another judge, whose jurisdiction it is not lawful for me to usurp. Know, that I make not war with the dead, but with the living, who still make war with me." He would therefore not suffer his tomb to be demolished, but forbade any attempt of that nature upon pain of death. Luther brought over to his sentiments Saxony, Denmark, Sweden, and a great part of the other kingdoms and states of Europe.

LUTHERANS, the Christians who follow the opinions of Martin Luther, one of the principal reformers of the church in the sixteenth century.

LUTHERN, in architecture, a kind of window over the cornice, in the roof of a building; standing perpendicularly over a naked wall, and serving to illuminate the upper story.

Lutherns are of various forms, as square, semi-circular, round, called bulls eyes, flat arches, &c.

LUXATION, *Luxatio*, in surgery, the recess or removal of the moveable extremity of a bone from the hollow or socket in which it naturally moved, accompanied with a hindrance of motion. This removal is either total or partial; the former is a luxation, and the latter a distortion. The method of healing luxations is very near the same with that of fractures. To cure a luxation two things are necessary; first, a reduction of the luxated parts; and secondly, a retention of them in their natural situation. We are also, during the course of the cure, by proper remedies and a due regimen, to mitigate the most troublesome symptoms, and to prevent future ones.

LYCEUM, in Grecian antiquity, an academy situated upon the banks of the Ilissus at Athens. It was composed of porticos and walks, where Aristotle taught philosophy, walking there constantly every day till the hour of anointing, whence

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he and his followers were called Peripatetics. See *Peripatetics*.

LYCHNIS, catch-fly, or cuckow-flow-er, in botany, a genus of plants.

LYCIUM, Avignon-thorn, in botany.

LYCODONTES, in natural history, the petrified teeth of the lupus-piscis, or wolf-fish, frequently found fossil.

LYCOPERDON, puff ball, in botany, a genus of funguses, of a fleshy substance like other mushrooms, and roundish shape.

LYCOPodium, wolf's claw-moss, in botany, a genus of mosses consisting of branches, furnished with leaves, and producing spikes formed of squamæ, of a different figure from the leaves.

LYCOPUS, water hore-hound, in botany.

* LYCURGUS, the celebrated legislator of the Spartans, was the son of Eunomes, king of Sparta. He travelled to Greece, to the isle of Crete, to Egypt, and even to the Indies, to converse with the sages and learned men of those countries, and to learn their manners, customs, and laws. After the death of his brother Polydictes, king of Sparta, his widow offered the crown to Lycurgus, promising she would make herself miscarry of the child of which she was pregnant, provided he would marry her; but Lycurgus nobly refused these advantageous offers, and afterwards contented himself with being tutor to his nephew Charillus, about the eight hundred and seventieth year before the Christian æra, and restored him the government when he came of age. Notwithstanding this generous conduct, he was accused of a design to usurp the crown: this calumny obliged him to retire to the island of Crete, where he applied himself to the study of the laws and customs of nations. At his return to Lacedæmon he reformed the government, and to prevent the disorders occasioned by luxury, and the love of riches, prohibited the use of gold and silver, placed all the citizens in a state of equality, and introduced the strictest temperance, the most exact discipline, and those admirable laws that have been celebrated by all historians. He is nevertheless justly blamed for having established it as a law, that the girls should wear an immodest dress, and for obliging them to perform the same exercises as the boys. The barbarous regulation he made against the infants, who, on their coming into the world, gave no hopes of their ever being vigorous and well made, is still more

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blameable. But excepting these, and a few other laws, it must be confessed that Lycurgus's institutions were wise and excellent. It is said, that to engage the Lacedæmonians to observe them inviolably, he made them promise with an oath not to change any part of them till his return, and he afterwards went to the island of Crete, where he killed himself, after having ordered, that his ashes should be thrown into the sea, for fear lest if his body should be carried to Sparta, the Lacedæmonians would think themselves absolved from their oath.

LYING-TO, or LYING-BY, in navigation, arranging the sails in such a situation that they counteract each other nearly with equal effort, some of them drawing her forward, and others forcing her back; the effect of which is, that she makes no way through the sea, only a very little to the leeward. The intent of lying-by, in general, is to wait for some ship or boat which is approaching or expected; or in the night-time to prevent running on land, shoals, or in the way of danger apprehended to be near.

LYING-TO in a storm, is going with a very little sail to keep the ship from rolling violently, and is more properly expressed by lying.

LYMPH, *Lympha*, a fine fluid, separated in the body from the mass of blood, and contained in peculiar vessels, called lymphatics.

The use of the lymph, Dr. Keil observes, may be gathered from the consideration of the parts into which it discharges itself: that which comes from the head, neck, and arms, is thrown into the jugular and subclavian veins; all the lymphatics which the parts in the cavity of the thorax send out, empty themselves into the thoracic duct; and the lymph from all the rest of the body, flows to the receptacle of the chyle; so that there can be no doubt but its chief use is to dilute and perfect the chyle before it mixes with the blood.

LYNX, or OUNCE, in zoology, a species of the fells kind, with a truncated tail, a brown body spotted with black; the head is large, but not very long; the forehead is flat; the eyes are very large and fierce; the ears are very large and open, but they terminate in a point at the top, and are there ornamented with a pencil of fine black hairs; the mouth is furnished with very terrible teeth, and there are whiskers about it, as also over the eyes; the neck is long and thick, the breast

L Y R

breast large and broad, the legs strong, the claws terrible, the tail short and abrupt; and the whole animal large and robust, somewhat less than the lion, very fierce, and remarkable for the quickness of its sight.

LYRE, *Lyra*, a musical instrument of the string kind, much used by the ancients. The lyre, among poets, painters, statuaries, carvers, &c. is attributed to Apollo and the muses.

LYRE, *Lyra*, in astronomy, a constellation of the northern hemisphere, the number of whose stars in Ptolemy's and Tycho's catalogues are only ten, but nineteen in the Britannic catalogue.

LYRIC, in general, signifies something sung or played on the lyre: but it is more particularly applied to the ancient odes and stanzas, answering to our airs and songs, and may be played on instruments.

The lyric is, of all kinds of poetry, the most poetical, and is as distinct, both in style and thought, from the rest, as poetry is in general from prose: it is the

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boldest of all other kinds, full of rapture, and elevated from common language the most that is possible: some odes there are likewise, in the free and loose manner, which seem to avoid all method, and yet are conducted by a very clear one; which affect transitions seemingly without art, but for that reason have the more of it; which are above connection, and delight in exclamations and frequent invocations of the muses; which begin and end abruptly, and are carried on through a variety of matter with a sort of divine pathos; above rules and laws, and without regard to the common forms of grammar. Pindar has set his successors the example of digressions and excursions. To write a lyric poem are required not only a flowing imagination, brightness, life, sublimity, and elegance, but the nicest art and finest judgment, so as to seem luxuriant, and not to be so: and under the shew of transgressing all laws, to preserve them.

LYSIMACHIA, willow-herb, in botany.

M.

M A C

M, A liquid consonant, and the twelfth letter of the English alphabet.

Its sound is always the same; it suffers no consonant after it in the beginning of words and syllables, unless in some derived from the Greek, as *amnesty*, &c.

M, in prescription, signifies a maniple, or handful; and at the end of a receipt it imports *misc*, or mingle.

M, in astronomy, &c. denotes meridional, southern; sometimes *meridies*, or mid-day.

M, in law, the brand of a person convicted of manslaughter, and admitted to the benefit of the clergy; it is burnt on the prawn of the left thumb.

M, among the ancients, a numeral letter, signifying one thousand; and with a dash added at the top of it, as **M̄**, it signified a thousand times a thousand.

MACAO, or **MACAW**, in ornithology, a name given to the larger species of parrots with very long tails,

M A C

MACARONIC, or **MACARONIAN**, an appellation given to a burlesque kind of poetry, made up of a jumble of words of different languages, and words of the vulgar tongue latinized.

MACCABEES, two apocryphal books of Scripture; so called from Judas Maccathias, surnamed Maccabeus. The first book of the Maccabees is an excellent history, and comes nearest the style and manner of the sacred historians of any extant: it contains the history of forty years from the reign of Antiochus Epiphanes to the death of Simon the high-priest; that is, from the year of the world 3829 to 3869, 131 years before Christ. The second book of the Maccabees begins with two epistles sent from the Jews of Jerusalem to the Jews of Egypt and Alexandria, exhorting them to observe the feast of the dedication of the new altar, erected by Judas on his purifying the temple. After these epistles follows the

the preface of the author to his history, which is an abridgement of a larger work, composed by one Jason, a Jew of Cyrene, who wrote the history of Judas Maccabeus and his brethren, and the wars against Antiochus Epiphanes, and Eupator his son. The second book falls infinitely short of the accuracy and excellency of the first. It contains a history of about fifteen years, from the execution of Heliodorus's commission, who was sent by Seleucus to fetch away the treasures of the temple, to the victory obtained by Judas Maccabeus over Nicanor; that is, from the year of the world 3818, to the year 3843, 147 years before Christ.

MACE, *Macis*, the second coat or covering of the nutmeg. It is a thin and flat membranous substance, of an oleaginous nature, a yellowish colour, extremely fragrant, and of a pleasant, but acrid and oleaginous taste. It is to be chosen new, not dry, and of a fragrant smell, tough, oleaginous, and of a good yellow. Mace is carminative, stomachic, and astringent; it possesses all the virtues of the nutmeg, if taken in a larger dose; and people have become delirious, for some hours, after an immoderate use of it. The oils of mace and nutmeg, whether prepared by distillation or by expression, are so much of the same nature, that they may be indiscriminately used for each other. They give ease in colics, and often in nephritic cases, taken internally from one drop to five or six, of the distilled oil, or an unequal quantity of the expressed; and externally, they are of use to rub upon paralytic limbs; they also assist digestion, and will often stop vomitings and hiccoughs, only by being rubbed on the region of the stomach. The nurses have a custom of applying oil of mace, by expression, to children's navels to ease their gripes, and that often with success; and we are assured by authors of credit, that rubbed on the temples, it promotes sleep. The oils, by distillation, are very properly added to the stronger cathartics in form of pills, and prove excellent correctives.

MACERATION, *Maceratio*, in pharmacy, an infusion or soaking of ingredients in water, &c. in order either to soften them or extract their virtues. It is a kind of digestion.

MACHINE, *Machina*, whatever hath force sufficient to raise or stop the motion of a heavy body. Machines are either simple or compound; the simple ones are the seven mechanical powers, viz.

the lever, balance, pulley, axis and wheel, wedge, screw, and inclined plane. If the given power, says Mr. Emerson, is not able to overcome the given resistance when directly applied, that is, when the power applied is less than the weight or resistance given; then the thing is to be performed by the help of a machine made with levers, wheels, pulleys, screws, &c. so adjusted, that when the weight and power are put in motion on the machine, the velocity of the power may be at least so much greater than that of the weight, as the weight and friction of the machine, taken together, is greater than the power. For on this principle depends the mechanism or contrivance of mechanical engines used to draw or raise heavy bodies, or overcome any other force; the whole design of these being to give such a velocity to the power in respect of the weight, as that the momentum of the power may exceed the momentum of the weight. For if machines are so contrived, that the velocity of the agent and resistant are reciprocally as their forces, the agent will just sustain the resistant; but with a greater degree of velocity will overcome it. So that if the excess of velocity in the power is so great as to overcome all that resistance which commonly arises from the friction or attrition of contiguous bodies, as they slide by one another, or from the cohesion of bodies that are to be separated, or from the weights of bodies to be raised; the excess of the force remaining, after all these resistances are overcome, will produce an acceleration of motion proportional thereto, as well in the parts of the machine, as in the resisting body. Now how a machine may be contrived to perform this to the best advantage will appear from the following rules.

1. Having assigned the proportion of your power and the weight to be raised, the next thing is to consider how to combine levers, wheels, pulleys, &c. so that working together, they may be able to give a velocity to the power, which shall be to that of the weight something greater than in the proportion of the weight to the power. This done you must estimate your quantity of friction, and if the velocity of the power be to that of the weight still in a greater proportion than the weight and friction taken together is to the power; then your machine will be able to raise the weight. And note, this proportion must be so much greater, as you would have your engine work faster.

2. But the proportion of the velocity of

MAC

of the power and weight must not be made too great neither: for it is a fault to give a machine too much power, as well as too little. For if the power can raise the weight and overcome the resistance, and the engine perform its proper effect in a convenient time, and works well, it is sufficient for the end proposed. And it is in vain to make more additions to the engine to increase the power any further; for that would not only be a needless expence, but the engine would lose time in working.

3. As to the power applied to work the engine, it may be either a living power, as men, horses, &c. or an artificial power, as a spring, &c. or a natural power, as wind, water, fire, weights, &c.

When the quantity of the power is known, it matters not as to the effect what kind of power it is; for the same quantity of any sort will produce the same effect. And different sorts of powers may be applied in an equal quantity, a great variety of ways.

The most easy power applied to a machine is weight, if it be capable of effecting the thing designed. If not, then wind, water, &c. if that can conveniently be had, and without much expence.

A spring is also a convenient moving power for several machines. But it never acts equally as a weight does; but is stronger when much bent, than when but a little bent, and that in proportion to the degree of bending, or the distance it is forced to. But springs grow weaker by often bending, or remaining long bent; yet they recover part of their strength by lying unbent.

The natural powers wind and water may be applied with vast advantage to the working of great engines, when managed with skill and judgment. The due application of these has much abridged the labours of men. For there is scarce any labour to be performed, but an ingenious artificer can tell how to apply these powers to execute his design, and answer his purpose. For any constant motion being given, it may, by a due application, be made to produce any other motions we desire. Therefore these powers are the most easy and useful, and of the greatest benefit to mankind. Besides, they cost nothing, nor require any repetition or renewing, like a weight or a spring, which require to be wound up. When these cannot be had, or cannot serve our end, we have recourse to some living power, as men, horses, &c.

MAC

4. Men may apply their strength several ways in working a machine. A man of ordinary strength, turning a roller by the handle, can act for a whole day, against a resistance equal to thirty pounds weight. And if he works ten hours in a day, he will raise a weight of thirty pounds three and a half feet in a second; or if the weight be greater, he will raise it so much less in proportion.

But a man may act, for a small time, against a resistance of fifty pounds or more.

If two men work at a windlass, or roller, they can more easily draw up seventy pounds than one man can thirty pounds, provided the elbow of one of the handles be at right angles to that of the other. And with a fly or heavy wheel applied to it, a man may do one-third part more work; and for a little while act with a force, or overcome a continual resistance, of eighty pounds, and work a whole day when the resistance is but forty pounds.

Men used to carrying, such as porters, will carry some one hundred and fifty pounds, others two hundred or two hundred and fifty pounds, according to their strength. A man can draw but about seventy or eighty pounds horizontally: for he can but apply about half his weight.

If the weight of a man be one hundred and forty pounds, he can act with no greater force in thrusting horizontally, at the height of his shoulders, than twenty-seven pounds.

A horse draws to greatest advantage, when the line of direction is a little elevated above the horizon, and the power acts against his breast; and can draw two hundred pounds for eight hours in a day, at two miles and a half an hour. If he draws two hundred and forty pounds, he can work but six hours, and not quite so fast; and in both cases, if he carries some weight, he will draw better than if he carried none. And this is the weight a horse is supposed to be able to draw over a pulley out of a well. In a cart, a horse may draw one thousand pounds. The most force a horse can exert is, when he draws something above a horizontal position.

The worst way of applying the strength of a horse, is to make him carry or draw up a hill. And three men, with one hundred pounds on their backs, will climb up a steep hill faster than a horse with three hundred pounds.

A round

A round walk for a horse to draw in, at a mill, &c. should not be less than forty feet diameter.

5. Every machine ought to be made of as few parts, and those as simple as possible, to answer its purpose; not only because the expence of making and repairing will be less, but it will also be less liable to any disorder. And it is needless to do a thing with many, which may be done with fewer parts.

6. If a weight is to be raised but a very little way, the lever is the most simple, easy, and ready machine. Or if the weight be very great, the common screw is most proper. But if the weight is to be raised a great way, the wheel and axle is a proper power, and blocks and pulleys are easier still; and the same may be done by help of the perpetual screw.

Great wheels to be wrought by men or cattle are of most use and convenience, when their axles are perpendicular to the horizon; but if by water, &c. then it is best to have their axles horizontal.

7. As to the combination of simple machines together, to make a compound one; though the lever when simple cannot raise a weight to any great height, and in this case is of little service; yet it is of great use when compounded with others. Thus the spokes of a great wheel are all levers perpetually acting; and a beam fixed to the axis to draw the wheel about by men, or horses, is a lever. The lever also may be combined with the screw, but not conveniently with pulleys or with the wedge. The wheel and axle is combined with great advantage with pulleys. The screw is not well combined with pulleys; but the perpetual screw combined with the wheel is very serviceable. The wedge cannot be combined with any other mechanical power; and it only performs its effect by percussion; but this force of percussion may be increased by engines.

Pulleys may be combined with pulleys, and wheels with wheels. Therefore if any single wheel should be too large, and take up too much room, it may be divided into two or three more wheels and trundles, or wheels and pinions, as in clock-work; so as to have the same power, and perform the same effect.

In wheels with teeth, the number of teeth which play together in two wheels ought to be prime to each other, that the same teeth may not meet at every revolution; for when different teeth meet, they by degrees wear themselves into a

proper figure: therefore they should be contrived that the same teeth meet as seldom as possible.

8. The strength of every part of the machine ought to be made proportional to the stress it is to bear. And therefore let every lever be made so much stronger, as its length and the weight it is to support is greater; and let its strength diminish proportionally from the fulcrum, or point where the greatest stress is, to each end. The axles of wheels and pulleys must be so much stronger as they are to bear greater weight. The teeth of wheels, and the wheels themselves, which act with greater force, must be proportionally stronger. And in any combination of wheels and axles, make their strength diminish gradually from the weight to the power, so that the strength of every part be reciprocally as the velocity it has. The strength of ropes must be according to their tension, and that is as the squares of their diameters. And in general whatever parts a machine is composed of, the strength of every particular part of it must be adjusted to the stress upon it; therefore in square beams the cubes of the diameters must be proportional to the stress they bear. And let no part be stronger or bigger than is necessary for the stress upon it: not only for the ease and well going of the machine, but for diminishing the friction. For all superfluous matter in any part of it, is nothing but a dead weight upon the machine, and serves for nothing but to clog its motion. And he is by no means a perfect mechanic, that does not only adjust the strength to the stress; but also contrives all the parts to last equally well, that the whole machine may wear together.

9. To have the friction as little as possible, the machine ought to be made of the fewest and simplest parts. The diameters of the wheels and pulleys ought to be large, and the diameters of the arbors or spindles they run on, as small as can be consistent with their strength. All ropes and cords must be as pliable as possible, and for that end rubbed with tar or grease; the teeth of wheels must be made to fit and fill up the openings; and cut into the form of epicycloids. All the axles, where the motion is, and all teeth where they work, and all parts that in working rub upon one another, must be made smooth; and when the machine goes, must be oiled or greased.

10. When any motion is to be long

continued, contrive the power to move or act always one way, if it can be done. For this is better and easier performed than when the motion is interrupted, and the power is forced to move first one way and then another; because every new change of motion requires a new additional force to effect it. Besides, a body in motion cannot suddenly receive a contrary motion, without great violence. And the moving any part of the machine contrary ways by turns, with sudden jerks, tends only to shake the machine to pieces.

11. In a machine that moves always one way, endeavour to have the motion uniform.

12. But when the nature of the thing requires that a motion is to be suddenly communicated to a body, or suddenly stopped; to prevent any damage or violence to the engine, by a sudden jolt, let the force act against some spring, or beam of wood, which may supply the place of a spring.

13. In regard to the size of the machine; let it be made as large as it can conveniently. The greater the machine the exacter it will work, and perform all its motions the better. For there will always be some errors in the making, as well as in the materials; and consequently in the working of the machine. The resistance of the medium in some machines has a sensible effect. But all these mechanical errors bear a less proportion to the motion of the machine in great machines than in little ones; being nearly reciprocally as their diameters; supposing they are made of the same matter, and with the same accuracy, and are equally well finished: therefore in a small machine they are more sensible; but in a great one almost vanish: therefore great machines will answer better than smaller, in all respects, except in strength. For the greater the machine the weaker it is, and less able to resist any violence.

14. For engines that go by water, it is necessary to measure the velocity and force of the water. To get the velocity, drop in pieces of sticks, &c. and observe how far they are carried in a second, or any given time.

But if it flows through a hole in a reservoir, or standing receptacle of water, the velocity will be found from the depth of the hole below the surface.

Thus let $s = 16 \frac{1}{2}$ feet, $v =$ velocity of the fluid per second. $B =$ the area of the

hole. $H =$ height of the water; all in feet. Then the velocity $v = \sqrt{2 \cdot H}$; and its force $=$ the weight of the quantity $\frac{v v}{2 s}$ B or H B of water, or $= \frac{62 \frac{1}{2}}{112} H B$ hundred weight: because a cubic foot is $= 62 \frac{1}{2}$ lb. avoird. Also a hoghead is about $8 \frac{1}{2}$ feet, or $531 \frac{1}{2}$ lb. and a ton is four hogheads.

When you have but a small quantity of water, you must contrive it to fall as high as you can, to have the greater velocity, and consequently more force upon the engine.

15. If water is to be conveyed through pipes to a great distance, and the descent be but small; so much larger pipes must be used, because the water will come slow.

Water should not be driven through pipes faster than four feet per second, by reason of the friction of the tubes. Nor should it be much wire-drawn, that is, squeezed through smaller pipes; for that creates a resistance, as the water-way is less in narrow pipes.

16. When any work is to be performed by a water wheel moved by the water running under it and striking the paddles or ladle boards, the channel it moves in ought to be something wider than the hole of the adjutage, and so close to the floats on every side, as to let little or no water pass; and when past the wheel, to open a little that the water may spread. It is of no advantage to have a great number of floats or paddles, for these past the perpendicular are resisted by the back-water, and those before it are struck obliquely. The greatest effect that such a wheel can perform, in communicating any motion, is when the paddles of the wheel move with $\frac{1}{2}$ the velocity of the water; in which case, the force upon the paddles is $\frac{1}{4}$ only; supposing the absolute force of the water against the paddle, when the wheel stands still, to be 1. So that the utmost motion which the wheel can generate, is but $\frac{1}{4}$ of that which the force of the water against the paddles at rest, would produce. This is when the wheel is at the best; but oftentimes far less is done. *Emerson's Mechanics.*

MACHINERY, in epic and dramatic poetry, is when the poet introduces the use of machines, or some supernatural being upon the stage, in order to solve some difficulty, or to perform some exploit out of the reach of human power.

The ancient dramatic poets never made use of machines, unless where there was an absolute necessity for so doing. It is quite otherwise with epic poets, who introduce machines in every part of their poems; so that nothing is done without the intervention of the gods. In Milton's *Paradise Lost*, by far the greater part of the actors are supernatural personages; Homer and Virgil do nothing without them; and in Voltaire's *Henriade*, the poet has made excellent use of St. Louis. As to the manner in which these machines should act, it is sometimes invisibly, by simple inspirations and suggestions; sometimes by actually appearing under some human form; and, lastly, by means of dreams and oracles, which partake of the other two. However, all these should be so managed as to keep within the bounds of probability.

MACKREL, in ichthyology, a species of scomber, with five pinnules at the extremity of the back, and a spine at the anus.

MACULÆ, in astronomy, dark spots appearing on the luminous faces of the sun, moon, and even some of the planets; in which sense they stand contradistinguished from *faculæ*. These spots are most numerous and easily observed in the sun. It is not uncommon to see them in various forms, magnitudes, and numbers, moving over the sun's disk. They were first of all discovered by the Lyncean astronomer Galileo, in the year 1610, soon after he had finished his new invented telescope.

What these spots are, it is presumed, no body can tell; but they seem to be rather thin substances than solid bodies, because they lose the appearance of solidity in going off the disk of the sun: they resemble something of the nature of scum or scoria, swimming on the surface, which are generated and dissolved by causes little known to us: but whatever these solar spots are, it is certain they are produced from causes very inconstant and irregular; for Scheiner says he frequently saw fifty at once, but for twenty years after scarce any appeared. And in this century the spots were very frequent and numerous till the year 1741, when, for three years successively, very few appeared; and now, since the year 1744, they have again appeared as usual.

These maculæ are not peculiar to the sun; they have been observed in all the planets. Thus Venus was observed to have several by signior Bianchini, in the year 1726. As in Venus, so in Mars

both dark and bright spots have been observed, first by Galileo, and afterwards by Cassini, &c. Jupiter has had his spots observable ever since the invention and use of large telescopes. Saturn, by reason of his great distance on one hand, and Mercury, by reason of his smallness and vicinity to the sun on the other, have not as yet had any spots discovered on their surfaces, and consequently nothing in relation to their diurnal motions and inclinations of their axis to the planes of their orbits can be known, which circumstances are determined in all the other planets, as well as in the sun, by means of these maculæ.

The spots, or maculæ, observable on the moon's surface, seem to be only cavities or large caverns, on which the sun shining very obliquely, and touching only their upper edge with his light, the deeper places remain without light; but as the sun rises higher upon them, they receive more light, and the shadow, or dark parts grow smaller and shorter, till the sun comes at last to shine directly upon them, and then the whole cavity will be illustrated: but the dark, dusky spots, which continue always the same, are supposed to proceed from a kind of matter or soil which reflects less light than that of the other regions. See *Moon*.

MADDER, in commerce, is one of the asperifolious stellated plants, or of those which have rough narrow leaves set in form of a star at the joints of the stalks. The root, which is the only part made use of, is long, slender, of a red colour both on the outside and within, excepting a whitish pith, which runs along the middle.

This plant was formerly cultivated among us in quantity for the use of the dyers, who for some time past have been supplied from Holland and Zealand: its culture is now again set on foot in this kingdom, under the laudable encouragement of a public society. There are some exotic plants, which degenerate in our climate, as alkanet; but this is not the case with madder, that produced in England being equal to the best that is brought from abroad.

The method of cultivating this useful plant, as practised by the Dutch, is as follows.

In autumn they plow the land, where they intend to plant madder in the spring, and lay it in high ridges, that the frost may mellow it; in March they plow it again; and at this season they work it

very deep, laying it up in ridges eighteen inches asunder, and about a foot high; then about the beginning of April, when the madder will begin to shoot out of the ground, they open the earth about their old roots, and take off all the side-shoots, which extend themselves horizontally, just under the surface of the ground, preserving as much root to them as possible: these they transplant immediately upon the tops of the new ridges, at about a foot-apart, observing always to do this when there are some showers, because then the plants will take root in a few days, and will require no water.

When the plants are growing, they carefully keep the ground hoed, to prevent the weeds from coming up between them; for if they are smothered by weeds, especially when young, it will either destroy or weaken them so much, that they seldom do well after. In these ridges they let the plants remain two seasons, during which time they keep the ground very clean; and at Michaelmas, when the tops of the plants are decayed, they take up the roots and dry them for sale.

This is what I could learn of their method of cultivating this plant; to which I will subjoin a few observations of my own, which I have since made upon the culture of madder in England. And, first, I find there is no necessity of laying the ground up in ridges in England, as is practised by the Dutch, especially in dry land, because the places where I saw it, were very wet land, which is often floated in winter; so that, if the plants were not elevated upon ridges, their roots would rot in winter. Secondly, they should be planted at a greater distance in England; the rows should be at least three feet distant, and the plants eighteen inches asunder in the rows: for as they extend themselves pretty far under ground, so where they are planted too near, their roots will not have room to grow. And thirdly, I find, that if all the horizontal roots are destroyed from time to time, as they are produced, it will cause the large downright roots to be much bigger, in which the goodness of this commodity chiefly consists: for if the upper roots are suffered to remain, they will draw off the principal nourishment from the downright roots, as I have experienced; for I planted a few roots upon the same soil and situation, which were of equal strength, and rooted equally well: half of these I hoed round, and cut off the horizontal roots, and the other

half I permitted the horizontal roots to remain on; and when I took them all up, those which I had hoed about, and kept clear from horizontal roots, were almost as large again as the other, and the roots were double the weight; which plainly proves it necessary to cut off those superfluous roots: so that where this plant is cultivated in quantity, it will be an excellent method to use the hoeing-plough, to stir the ground, and destroy the weeds; for with this instrument a large quantity of ground may be kept clean at a small expence; and as this will stir the ground much deeper than a common hoe, it will cut the superficial roots, and thereby improve the principal roots.

The crop of madder should be shifted into fresh land; for the ground which has had one crop, will not be fit to receive another in less than four years; during which time any other annual crop may be cultivated on the land. *Miller.*

When the madder roots are arrived at perfection, they are taken up, well dried, and then reduced to powder by a mill.

Madder root gives out its colour both to water and to rectified spirit: the watery tincture is of a dark dull red, the spirituous of a deep bright one. Taken internally it tinges the urine red. In the Philosophical Transactions, and in the Memoirs of the French Academy, there are accounts of its producing a like effect upon the bones of animals, to whom it had been given with their food: all the bones, particularly the more solid ones, were changed, both externally and internally to a deep red, but neither the cartilaginous or fleshy parts suffered any alteration. Some of these bones, macerated in water for many weeks together, and afterwards steeped and boiled in spirit of wine, lost nothing of their colour, nor communicated any tinge to the liquors. Madder imparts to woollen cloth, prepared with alum and tartar, a very durable, though not a very beautiful red dye. As it is the cheapest of all the red drugs that give a durable colour, it is the principal one commonly made use of for ordinary stuffs. Sometimes its dye is heightened by the addition of Brazil wood, and sometimes it is employed in conjunction with the dearer reds, as cochineal, for demi-scarlets and demi-crimsons.

The charge of erecting a kiln for drying, and a mill for pulverizing the madder roots, induced Mr. Dambourney to try how far the green root would answer the

the purposes of dyeing without any previous preparation. "I therefore, says this ingenious gentleman, washed them well, that no earth might remain upon them: but having myself experienced that, as Mr. Du Hamel observes, this root loses seven eighths of its weight when it is dried sufficiently to be reduced into powder, I judged that I must proportion my quantity accordingly. I therefore put into a quantity of liquor which would have required a pound of powdered madder, eight pounds of fresh roots bruised in a mortar, and with this I dyed some cotton, in the usual way. When the dyeing was finished, I found that the liquor was still over-charged, though the cotton had imbibed so deep a dye as to require two boilings to bring it down to the usual colour: upon which I repeated the experiment with six pounds, and afterwards with four pounds, and I found that this last proportion of undried roots is that which gives a colour equal to what is extracted from a pound of dried and powdered madder. One half of the quantity of roots commonly used may therefore be saved by dyeing with them when they are fresh dug: but tho' this is a great saving, it is not the only one.

"1. There is no need to build kilns or sheds for drying the roots in changeable weather.

"2. One is exempted from the inconveniences of a too hasty or too slow drying, either of which is equally hurtful to the quality of the madder.

"3. The waste occasioned by the peeling, garbling, winnowing, &c. of the roots, in the doing of which many if not all of the small ones, that are not for example thicker than straws, are separated with the refuse parts, and thereby generally lost, is hereby saved.

"4. The expence of grinding is saved, together with the waste and fraud which may be committed at the mill; and likewise the inconvenience of waiting till the mill is at liberty, which is of no small consequence in places where there are not mills appropriated to the grinding of madder only.

"5. Lastly, the roots thus used do not evaporate or ferment, as the powdered madder always does if it be not speedily used.

"All these advantages put together may be deemed equivalent to a saving of five eighths in the quantity. The planter who knows how to dye may reap the benefit of them the moment that his roots

are large enough to be taken up: the dyers by trade will by degrees be sensible of the advantage, and share the profit with the planter, when the madder grounds are near them: they will even find themselves under a necessity of so doing whenever this method shall become general, and this will be the means of rendering it such; for as there is no particular time to be waited for in order to the madder's acquiring maturity, after it has been planted eighteen months; the husbandman who carries a parcel of fresh roots to market will be sure of selling them in that state, and the dyer may buy them daily, in proportion to the quantity he wants; or he may agree with the planter for such and such quantities to be delivered to him at such and such times.—I have moreover experienced that these roots may be kept fresh during several months, by laying them in a hole three feet deep, in alternate layers of roots and of earth."

MADNESS, *Mania*, a most dreadful kind of delirium without a fever. Melancholy and madness are diseases nearly allied; for they have both the same origin, that is, an excessive congestion of blood in the brain: they only differ in degree, and with respect to the time of invasion; melancholy being the primary disease, of which madness is the augmentation. Both these disorders suppose a weakness of the brain, which may proceed from an hereditary disposition; from violent disorders of the mind, especially long continued grief, anxiety, dread, and terror; from close study and intense application, of mind to one subject; from narcotic and stupifying medicines; from previous diseases, especially acute fevers; from a suppression of hæmorrhages, and omitting customary bleeding; from excessive cold, especially of the lower parts, which forces the blood to the lungs, heart, and brain; and from violent anger, which will change melancholy into madness. It is evident that the blood of maniac patients is black, and hotter than in the natural state; that the serum separates more slowly and in a less quantity than in healthy persons; and that the excrements are hard, of a dark red or greyish colour, and the urine light and thin. The antecedent signs of madness are, a redness and suffusion of the eyes with blood, a tremulous and inconstant vibration of the eye-lids, a change of disposition and behaviour; supercilious looks, a haughty carriage,

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carriage, disdainful expressions, a grinding of the teeth, and unaccountable malice to particular persons: also little sleep, a violent headach, quickness of hearing, incredible strength, insensibility of cold, and in women, an accumulation of blood in the breasts, in the increase of this disorder. Diseases of the mind have something in them so different from other disorders, that they sometimes remit for a long time, but return at certain periods, especially about the solstices. It may likewise be observed, that the raving fits of mad people, which keep the lunar periods, are generally accompanied with epileptic symptoms. This disease, when it is primary or idiopathic, is worse than the symptomatic, that accompanies the hysteric or hypochondriac passion; which is easily cured, as is that also which succeeds intermitting fevers, a suppression of the menses, of the lochia, of the hæmorrhoids, or which is occasioned by narcotics. When the paroxysms are slight in the idiopathic kind, the cure is not very difficult; but if it is inveterate, and has but short remissions, it is almost incurable. Sometimes this disease terminates by critical excretions of blood from the nose, uterus, or anus; sometimes diarrhæas and dysenteries will terminate these disorders; and pustules, ulcers, and the itch have also done the same. As to the cure, bleeding is the most efficacious of all remedies; and where there is a redundancy of thick grumous blood, a vein is first to be opened in the foot, a few days after in the arm; then in the jugular vein, or one in the nostrils with a straw; and last of all the frontal vein, with a blunt lancet, for fear of hurting the pericranium. Tepid baths made of rain or river water are also convenient; and before the patient enters the bath, he should have cold water poured on his head. Purgatives are likewise useful; but the lenient are to be preferred to the drastic: thus, manna, cassia, rhubarb, cream of tartar, or tartar vitriolate, are most convenient, when the disease arises from the hypochondriac passion, a stagnation of blood in the intestines, or in the ramifications of the vena portæ, especially when taken in decoctions and infusions at repeated intervals, so as to operate in an alterative manner. Some kinds of mineral waters are also highly efficacious in melancholy and madness: but nothing is better for removing the cause of these disorders, than depurated mercury. Particular medicines among vegetables,

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are balm, betony, vervain, brook-lime, sage, worm-blood, flowers of St. John's wort, of the lime-tree, and camphire: from animals, ass's blood: among minerals, steel, cinnabar, sugar of lead, and the calx and tincture of silver. Hoffman is of opinion, that nothing better deserves the name of a specific in these diseases than motion and exercise, when duly proportioned to the strength of the body. Sedative medicines are good, but not opiates and narcotics, for these induce stupidity and folly: those that are good in an epilepsy will be here beneficial, such as castor, shavings of hartshorn, the roots and seeds of piony, anti-epileptic powders, the valerian root, flowers of the lilly of the valley, and of the lime-tree. Boerhaave says, the principal remedy for raving madness is dipping in the sea, and keeping the patient there as long as he can bear it. As a high degree of the itch has terminated these disorders, it may be proper to make issues in the back; but blisters, contrary to Shaw's opinion, are prejudicial; for by stimulating the nervous membranes and the dura mater, they increase the spasmodic stricture, and the motion of the gross and bilious blood through the head and the other parts of the body. As to diet, the patient should carefully abstain from salt and smoked flesh, whether beef or pork; from shell-fish; from fish of a heavy and noxious quality; from aliments prepared with onions and garlic: all which generate a thick blood. He should in general eat no more than is sufficient to support nature. Small beer, or cold pure water, are the best drink; but sweet and strong wines are highly prejudicial, as is also excessive smoking tobacco. Change of air and travelling may be beneficial.

For the madness proceeding from the bite of a mad dog, see *Hyærophobia*.

MADREPORA, in botany, a genus of submarine plants, of a stony hardness, but somewhat approaching to the form of other vegetables. It is composed of a main stem, and subdivided into a number of branches, which are full of holes or pores, in a radiated form.

MADRIGAL, a short amorous poem, composed of a number of free and unequal verses, neither confined to the regularity of a sonnet, nor to the point of an epigram, but only consisting of some tender and delicate thought, expressed with a beautiful, noble, and elegant simplicity. The madrigal is usually considered

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as the shortest of all the lesser kinds of poetry, except the epigram: it will admit of fewer verses than either the sonnet or the roundelay; no other rule is regarded in mingling the rhimes, and the different kinds of verse, but the fancy and convenience of the author: however, this poem allows of less licence than many others, both with respect to rhyme, measure, and delicacy of expression.

* **MÆCENAS** (**CAIUS CILNIUS**) the favourite of Augustus, and the protector of learned and ingenious men, was descended from the ancient kings of Tuscany; he was extravagantly fond of ease and pleasure, and yet when affairs required it, applied to business with surprising wisdom and activity. Augustus had no favourite who was dearer, or more agreeable to him. Seneca says, that Mæcenas's style might have been given as a model of eloquence, if his good fortune had not rendered it too soft and effeminate. It is said, that when Augustus was one day distributing justice, and having already condemned a great number of criminals, Mæcenas not being able to approach him, threw his tablets at him, on which these words were written with his own hand: "Rise thou executioner, and be gone." At which liberty Augustus was not offended, but immediately left the place. Mæcenas zealously protected the poets, particularly Virgil and Horace, whom he placed among the number of his friends, one of whom dedicated his *Georgics* to him, and the other his *Odes*. His protection of the learned, has chiefly immortalized his name, and caused that of Mæcenas to be given to the patrons of men of letters. He was contented with the rank of a knight, and would not be raised to a higher degree of honour. He died eight years before the Christian era, after having composed several works, which are now lost.

MAGAZINE, a place in which stores are kept of arms, ammunition, provisions, &c.

MAGAZINE of a *Ship of War*, a small store-house in the after or fore-part of a ship's hold, where the gun-powder is stowed, and filled into cartridges, bombs, grenades, &c. by the gunner and his mates, ready for engagement.

MAGAZINE, a name given to several periodical pamphlets, most of which are published the first of every month. The word *Magazine*, in French, signifies a warehouse or repository for a variety of articles; whence the term is applied to

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these monthly publications, from their great variety of miscellaneous articles, unconnected with each other.

MAGDALEN, or *Nunn of St. Magdalen*, an order of religious in the Romish church, dedicated to St. Mary Magdalen, and sometimes called *Magdalenettes*. These chiefly consist of courtezans, who quitting their profession, devote the rest of their lives to repentance and mortification.

MAGI, or **MAGIANS**, an ancient religious sect in Persia, and other Eastern countries, who maintained, that there were two principles, the one the cause of all good, the other the cause of all evil; and abominating the adoration of images, worshipped God only by fire, which they looked upon as the brightest and most glorious symbol of Oromasdes, or the good god, as darkness is the truest symbol of Arimanius, or the evil god. This religion was reformed by Zoroaster, who maintained that there was one supreme independent Being, and under him two principles or angels, one the angel of goodness and light, and the other of evil and darkness: that there is a perpetual struggle between them, which shall last to the end of the world; that then the angel of darkness and his disciples shall go into a world of their own, where they shall be punished in everlasting darkness; and the angel of light and his disciples shall also go into a world of their own, where they shall be rewarded in everlasting light. The priests of the Magi were the most skilful mathematicians and philosophers of the ages in which they lived, inasmuch that a learned man and a Magian became equivalent terms.

This sect still subsists in Persia under the denomination of Gauris, where they watch the sacred fire with the greatest care, and never suffer it to be extinguished.

MAGIC originally signified only the knowledge of the more sublime parts of philosophy; but as the Magi likewise professed astrology, divination, and sorcery, the term Magic became odious, being used to signify an unlawful diabolical kind of science, acquired by the assistance of the devil and departed souls.

Natural magic is only the application of natural philosophy to the production of surprising, but yet natural effects.

MAGIC LANTERN, in optics. See *Lantern*.

MAGIC SQUARE, a square figure formed of a series of numbers in arithmetical

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tical progression, disposed into such parallel and equal ranks, as that the sums of each row, as well diagonally as laterally, shall be equal.

MAGISTERY, in chemistry, commonly denotes a white powder, prepared of certain substances by precipitation. These substances are either of the mineral kind, as earth, stones, &c. or vegetables, as herbs, raisins, &c. or animals, as bones, horns, and crustaceous parts.

MAGISTERY of Bismuth is made by dissolving bismuth in spirit of nitre, and pouring on it salt water, which precipitates the magistery to the bottom.

MAGISTERY of Lead is made by dissolving saccharum saturni in distilled vinegar, and then precipitating it with oil of tartar per deliquium.

MAGISTERY of Resins, or resinous extracts of scammony, jalap, &c. are made by dissolving the matter in spirit of wine, and precipitating it with water.

MAGISTRATE, a justice of the peace, or any public officer, to whom the executive power of the law is committed, either wholly or in part.

MAGNA CHARTA, the great charter of the liberties of England, and the basis of our laws and privileges. This charter may be said to derive its origin from king Edward the Confessor, who granted several privileges to the church and state, by charter: these were also granted and confirmed by king Henry I. by a celebrated great charter, now lost; but which was confirmed or re-enacted by king Henry II. and king John. Henry III. the successor of this last prince, after having caused twelve men to make enquiry into the liberties of England in the reign of Henry I. granted a new charter, which was the same as the present Magna Charta: this he several times confirmed, and as often broke; till in the thirty-seventh year of his reign, he went to Westminster-hall, and there, in the presence of the nobility and bishops, who held lighted candles in their hands, Magna Charta was read, the king all the while holding his hand to his breast, and at last solemnly swearing faithfully and inviolably to observe all the things therein contained, &c. then the bishops extinguishing the candles, and throwing them on the ground, they all cried out, "Thus let him be extinguished, and sink in hell, who violates this charter." It is observed, notwithstanding the solemnity of this confirmation, king Henry, the very next year, again invaded the rights

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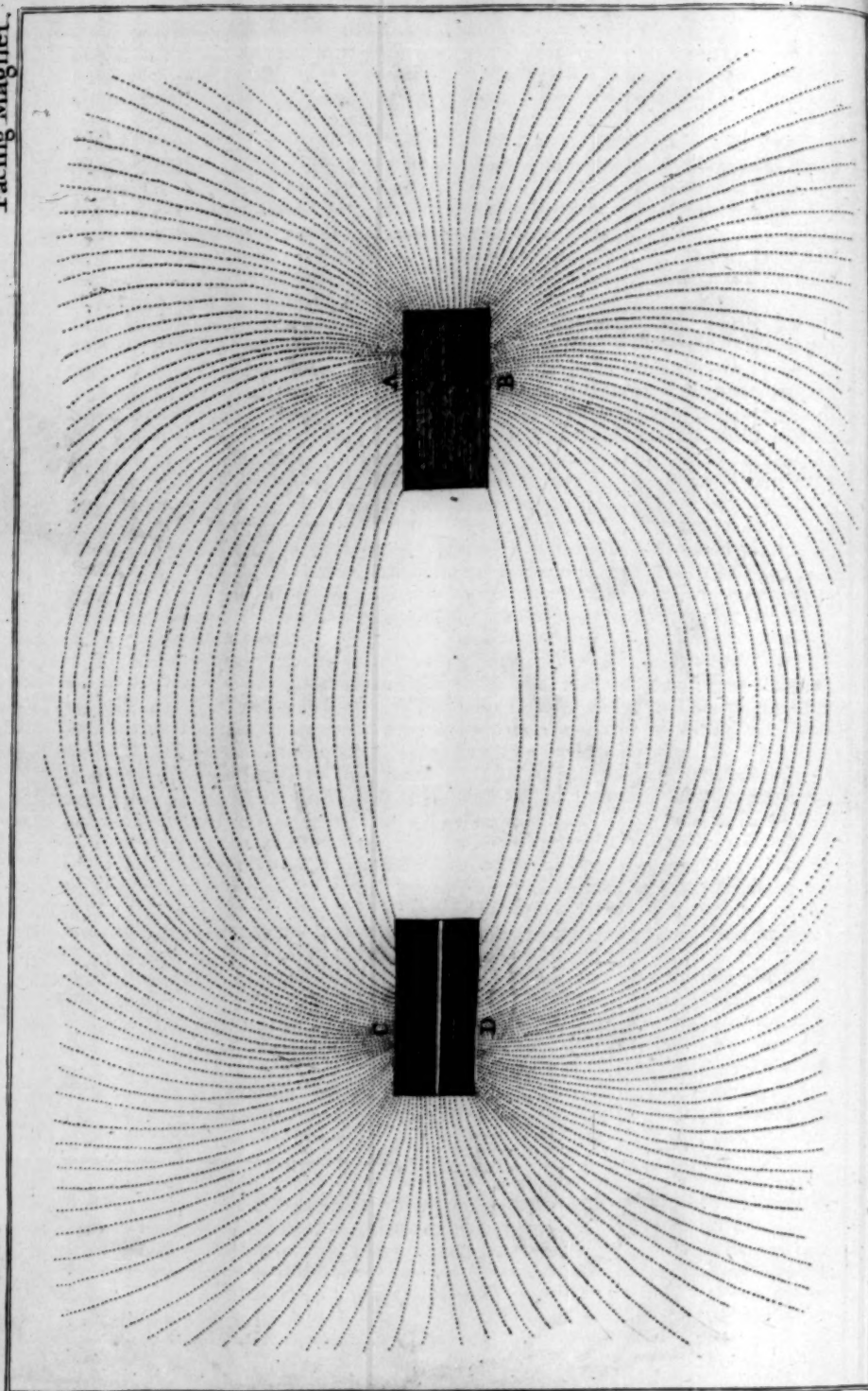
of his people, till the barons entered into a war against him, when, after various success, he confirmed this charter, and the charter of the forest, in the fifty-second year of his reign. This excellent charter, so equitable and beneficial to the subject, is the most ancient written law in the kingdom: by the 25th Edw. I. it is ordained, that it shall be taken as the common law; and by the 43 Edw. III. all statutes made against it are declared to be void.

MAGNESIA ALBA, in the materia medica, a fine white earth, soluble readily in all acids, the vitriolic as well as the others, into a bitter purgative liquor; and not convertible by fire into quicklime. This earth has not hitherto been found naturally pure or in a separate state: it was several years a celebrated secret in the hands of some particular persons abroad, till its preparation was made public by Læncisi in the year 1717, and afterwards by Hoffman in 1722. It was then extracted from the mother-ley, or the liquor which remains after the crystallization of rough nitre; either by precipitation with a solution of fixed alkaline salt, or by evaporating the liquor, and calcining the dry residuum, so as to dissipate the acids, by which the earth had been made dissoluble.

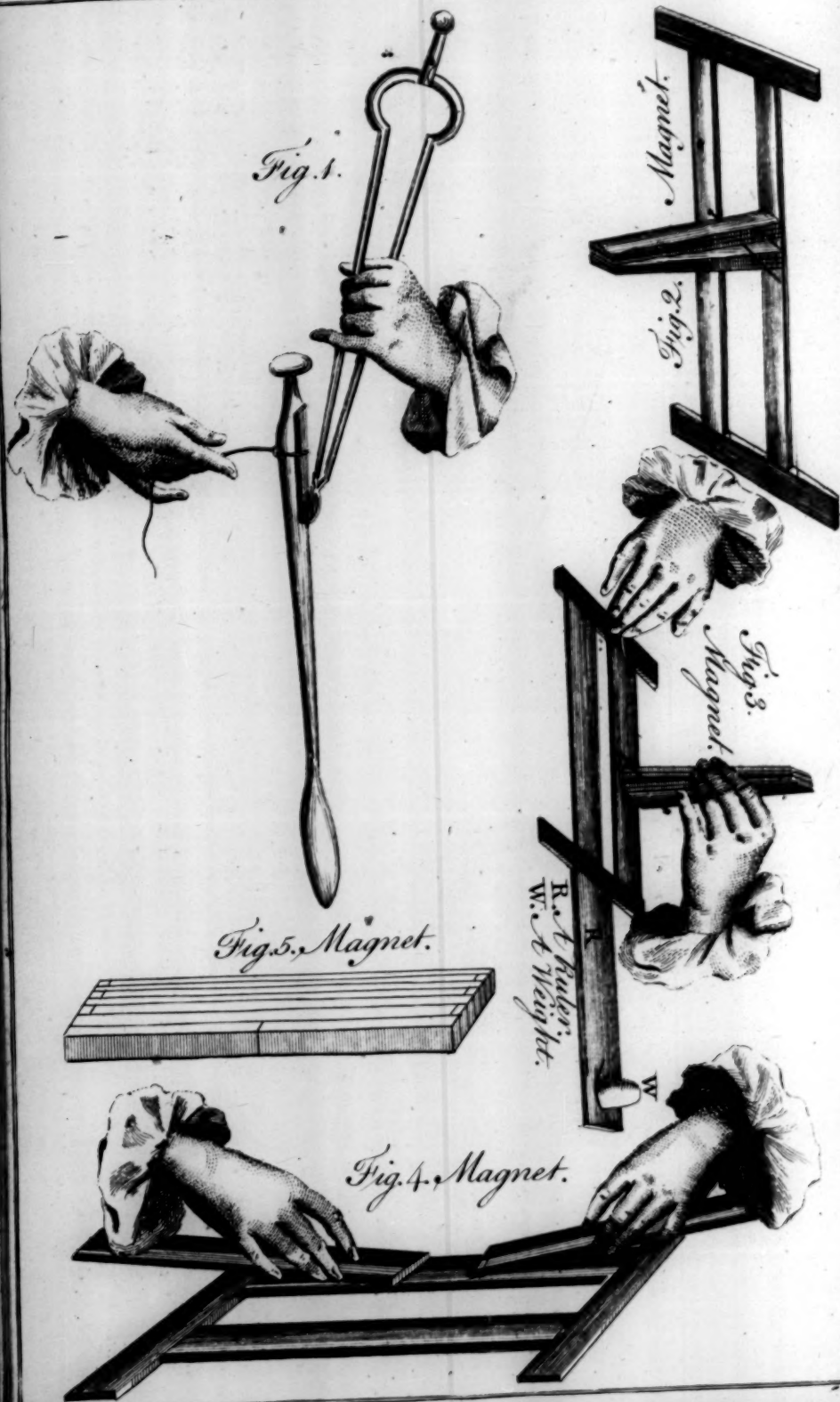
The true magnesia is obtained in great purity from a filtered solution of sal catharticus amarus; by adding a filtered solution of any alkaline salt, till a fresh addition produces no further m'kiness. The white earth, which precipitates, is to be washed by repeated affusions of hot as well as cold water, and then dried for use.

The magnesia is recommended by Hoffman as an useful anti-acid, a safe and inoffensive laxative in doses of a dram or two, and a diaphoretic and diuretic, when given in smaller doses, as fifteen or twenty grains. Since this time, it has of late come into great esteem among us, particularly in heart-burns, and for preventing or removing the many disorders which children are thrown into from a redundancy of acid humours in the first passages. It is preferred, on account of its laxative quality, to the testaceous and other absorbent earths, which, unless gentle purgatives are given occasionally to carry them off, are apt to lodge in the body, and occasion a costiveness very detrimental to infants. It must be observed, however, that it is not the magnesia itself which proves laxative, but the saline compound









compound resulting from its coalition with acids: if there are no acid juices in the stomach to dissolve it, it has no sensible operation, and in such cases it may be rendered purgative by drinking any kind of acidulous liquors after it. All the other known soluble earths yield with acids, not purgative, but more or less astringent compounds.

MAGNET, *Magnes*, loadstone, in natural history, a very rich iron ore, found in large detached masses, of a dusky iron grey, often tinged with brownish or reddish, and when broken appearing something like the common emery, but less sparkling. It is very heavy, considerably hard, of a perfectly irregular and uneven surface, and of a firm structure, but usually with some porous irregularities within. It is found in England, and all other places where there are iron mines.

The word is derived from a city in Lydia, called Magnesia, where this stone was first found.

This famous stone was well known to the ancients, but scarce any other property of it than that of its attracting iron, as we may see in Pliny, b. 36. c. 16. However, it appears that they knew something of its communicating virtue, particularly Plato, when describing that famous chain of iron rings put together, the first of which was held by a magnet; and Lucretius makes mention of the same magnetic quality operating through the hardest bodies.

But we do not see by any passage in their writings that they knew any thing of the directive virtue of the loadstone: and we are utterly in the dark as to the time this discovery was first made, as also when it was applied to the use of navigation. It however appears that this discovery was made before the year one thousand one hundred and eighty.

The primary properties of the loadstone are the following: 1. Every loadstone has two points, called poles, which emit the magnetic virtue. 2. One of these poles attracts, the other repels iron, but no other body. 3. This virtue, being the third species of attraction, is communicated to iron very copiously by the touch, which renders it strongly magnetic. 4. A piece of iron so touched by the loadstone, and nicely suspended on a sharp point, will be determined to settle itself in a direction nearly north and south. 5. The end of the needle touched by the south pole of the stone will

point northward; and the contrary. 6. Needles touched by the stone will dip below the horizon, or be directed on the touched part to a point within the earth's surface: this is called the dipping needle. 7. This virtue may also be communicated to iron by a strong attrition all one way. 8. Iron rods or bars acquire a magnetic virtue by standing long in one position. 9. Fire totally destroys this virtue, by making the stone or iron red hot. 10. This power is exerted sensibly to the distance of several feet. 11. It is sensibly continued through the substance of several contiguous bodies or pieces of iron. 12. It pervades the pores of the hardest body. And, 13. Equally attracts the iron in vacuo as in open air. These, and many more, are the properties of a body, not more wonderful than useful to mankind. See the articles *Pole*, *Needle*, *Variation*, &c.

There is a very curious method of rendering visible the directions which the magnetic effluvia take in going out of the stone: thus, let A B, C D, (plate XXX. fig. 1.) be the poles of the stone; about every side gently strew some steel filings on a sheet of white paper; these small particles will be affected by the effluvia of the stone, and so posited as to show the course and direction of the magnetic particles on every part: thus, in the middle of each pole, between A B, and C D, it appears to go nearly straight on; towards the sides it proceeds in lines more and more curved, till at last the curved lines from both poles meeting and coinciding, form numberless curves on each side, nearly of a circular figure, as represented in the diagram. This seems to shew that the magnetic virtue emitted from each pole, circulates to, and enters the other.

The cause of the variation of the needle has remained hitherto without any demonstrative discovery; yet since its declination, and inclination, or dipping, (see *Dipping Needle*,) do both of them manifestly indicate the cause to be somewhere in the earth, it has given occasion to philosophy to frame hypotheses for a solution, which makes the earth a large or general magnet or loadstone, of which all the lesser ones are but so many parts or fragments, and being possessed of the same virtue, will, when left to move freely, have the same disposition and similarity of position, and other circumstances.

The most considerable of these hypotheses is that of the late sagacious Dr.

Halley, which is this; the globe of the earth is one great magnet, having four magnetical poles or points of attraction, near each pole of the equator two; and that in those parts of the world which lie near adjacent to any one of those magnetical poles, the needle is chiefly governed thereby, the nearest pole being always predominant over the more remote one. Of the north poles, that which is nearest to us he supposes to be in the meridian of the land's end, which governs the variations in European Tartary, and the North Sea; the other he places in a meridian passing through California, about fifteen degrees from the north pole of the world, which governs the needle in North America, and the oceans on either side. In like manner he accounts for the variations in the southern hemisphere. See *Philosophical Transactions*, No. 148.

The variation of the needle from the north and south points of the horizon, not being the same but variable in different years, and in a diverse manner, in different parts of the earth, made the doctor farther conjecture, that two of the magnetic poles were fixed, and two moveable; and in order to make this out, he supposes the external part of the earth to be a shell or cortex, containing within it a magnetic moveable nucleus of a globular form, whose center of gravity is the same with that of the earth, and moveable about the same axis.

Now, if the motions of both the shell and nucleus were the same, the poles of each would always have the same position to each other; but he supposes the motion of the nucleus to be a very small matter less than that of the shell, which yet is scarce sensible in 365 revolutions; and, if so, the magnetic poles of the nucleus will by slow degrees change their distance from the magnetic poles of the shell, and thus cause a variation in that needle's variation, which is governed by the moveable pole of the nucleus, while that variation which respects the fixed poles of the magnetic shell remains more constant; as in Hudson's-bay the change is not observed to be near so fast as in these parts of Europe.

The variation of the needle has within a century past undergone a remarkable alteration; for at London it was observed by Mr. Burrows in the year 1580, to be $11^{\circ} 15'$ east. After that, in the year 1611, it was observed by Mr. Gunter to be but 6° east. In the year 1634, Mr.

Gellibrand observed it to be $4^{\circ} 5'$ east. In 1657, it was observed by Mr. Bond to be nothing at all, that is, the needle placed itself in the situation S, N, and pointed directly to the north. After this, in the year 1671, Dr. Halley observed it to be $2^{\circ} 30'$ westward; and again, in the year 1692, he found it 6° west. Since then, in the year 1722, Mr. Graham, by most accurate experiments, found it to be $14^{\circ} 13'$, and at present it is between 19 and 20 degrees; and in some places it has been found to be 23° westward.

The variation of the declination and inclination of the needle is variable, and subject to no regular computation. What the quantity of both sorts of variation is in the several parts of the world, is shewn in Dr. Halley's map of the world, improved from the observations of Mr. Pound.

The law of magnetic attraction seems not yet ascertained. Sir Isaac Newton supposes it to decrease nearly in the triplicate ratio of the distance; but Dr. Hellmham, trying the experiment by his loadstone, found it to be as the squares of the distances inversely; and Mr. Martin assures us, that the power of his loadstone decreases in a different manner from either, it being in the sesquiplicate ratio of the distances inversely: for exactness, he made a square bar of iron just a quarter of an inch thick, and then provided three pieces of wood of the same form and thickness exactly; then posing the loadstone very nicely at the end of a ballance, which would turn with less than a grain, he placed under it the iron with first one piece of wood, then two pieces; and lastly, all three pieces upon it; by which means the steel-points of the pole were kept at $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, of an inch from the iron; and in those distances the weights put into the opposite scale, to raise the loadstone from the wood, which is touched while the beam was horizontal, were as follow:

	Gr.	Rat of Sq.	Rat. of Cub.	S. Rat.
Dist.	$\frac{1}{4}$ —156	—156—	—56—	—156
	$\frac{1}{2}$ —58	—39—	—19—	—56
	$\frac{3}{4}$ —28	—17—	—6—	—30

Whence it appears that the number of grains to counteract the power of the loadstone in these distances, approach very near, and are almost the same with those which are in the sesquiplicate ratio, but are widely different from those which are in the duplicate ratio; and this experiment Mr. Martin tried several times for each

each distance, with scarce any variation in the success.

The power or force of magnets is generally greater in small than in large ones, in proportion to their bulk. It is very rare that very large ones will take up more than three or four times their own weight, but a small one is but tolerably good that will take up no more than eight, ten, or twelve times its weight.

Iron bars, by standing long in the same position, will acquire the magnetic virtue to a surprising degree. There have been seen one about 10 feet long and three inches thick, supporting the summer-beam of a room, which has been able to turn the needle at 8 or 10 feet distance, and exceeded a loadstone of $3\frac{1}{2}$ pounds weight. From the middle point upwards it was a north-pole, and downwards a south-pole; and Mr. Martin says he has now by him an iron rod, which has several poles or parts which change the position of the magnetic needle.

The poles of a loadstone are not to be looked upon as two such invariable points as never to change place; for according to Mr. Boyle, the poles of a little bit of magnet may be changed by applying them to the more vigorous poles of another, as has been confirmed by Dr. Knight, who can change at pleasure the poles of a natural magnet, by means of iron-bars magnetically impregnated. Upon gently cutting a magnet through the middle of its axis, each piece becomes a complete magnet; for the parts that were contiguous under the equator before the magnet was cut, become poles, and even poles of different names; so that each piece may become equally a north or south-pole, according as the section was made nearer the south or north pole of the large magnet; and the same thing would happen in any other sub-divisions. But upon cutting a magnet longitudinally, there will then be four poles, the same as before the cutting; only that there shall be formed in each piece a new axis parallel to the former, and more or less in the inside of the magnet. We find by experience, that two magnets attract each other by the poles of different denominations; whereas, on the contrary, the two similar poles repel each other.

By a great number of experiments we also learn that the form of a magnet in attraction and repulsion reaches sometimes farther, sometimes not so far. The activity of some reaches to 14 feet, and that of others is insensible within eight or

nine inches; the sphere of activity is greater on certain days than on others, without its ever appearing that the heat, moisture, or drought of the air contribute any thing to this effect.

It has been found that the poles of the same denomination in magnets, and the case is the same in bodies magnetically impregnated, repel each other, while they are at a mean distance from the limits of their sphere of activity, and on the contrary attract each other in the point of contact; there are other magnets that repel each other with greater vigour towards the middle of their sphere of activity than near the point of contact, where it seems the repulsion diminishes: yet Mr. Mitchel pretends to have observed, by means of artificial magnets, that the two poles attract and repel equally at the same distances, and in all kinds of direction; that the error of those who believed the repulsion to be weaker than the attraction was owing to this, that magnets and magnetical bodies are always weakened, by bringing the poles of the same denomination near each other; whereas their virtue is increased, when the poles of different denominations are brought near each other; that this augmentation or diminution of force, occasioned by the proximity of two magnets, becomes insensible, in proportion as they are removed from each other: for which reason we see that at a great distance attraction and repulsion approach more and more to an equality, and are reciprocally removed from equality, in proportion as the reciprocal distance of two magnets diminishes; so that if a magnet, which is pretty strong and pretty nigh to it, impair considerably a weak magnet that approaches it by the poles of the same denomination, it shall happen that the pole of this last shall be destroyed and changed into a pole of a different denomination, by means of which repulsion will be converted into attraction. In short, by many experiments, Mr. Mitchel was convinced, that attraction and repulsion increase and decrease in the inverse ratio of the squares of the respective distances of the two poles.

All these effects of natural repulsion and attraction find no obstacle from solids or fluids, the wind, flame, or the current of waters; and they are as lively in common air, as in that which is rarefied or condensed in the air-pump.

The magnet attracts iron with still greater force than it does another magnet;

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and this attraction extends to all bodies that contain ferrugineous particles.

No solid or fluid body can any way hinder the mutual action of iron and a magnet upon each other, unless it be iron itself: nor does the excessive heat of iron diminish these effects, though the excessive heat of a magnet diminish its virtue, at least for a time.

The attraction of a magnet newly dug out of a mine, makes it to take up only very small pieces of iron; for which reason it must be armed, in order to augment its force: besides this, the arming it unites, directs, and condenses its virtue towards its poles, and causes its emanations to tend entirely towards the mass which is laid thereon.

When you have determined where the poles are, which you may exactly find by placing over the magnet a very fine short needle, which will stand perpendicular over each pole, and no where else; then you must file it very smooth at its poles, so that the axis shall have the greatest length, yet without too much diminishing its other dimensions. To determine the proportions of the armour, the greater the force of the magnet is, the thicker must the pieces of steel be of which it is to consist; and for this purpose try the magnet with several steel-bars, and the greater weight it takes up with a steel-bar on, that bar is to be its armour. Though the attraction of an armed magnet appears considerable, yet very weak causes destroy its effect in a moment: for instance, when an oblong piece of iron is attracted under the pole of an excellent magnet, and the pole of a different denomination in another magnet that is weaker is presented to the lower end of this piece of iron, this weaker magnet will very strongly take away the iron. In like manner, if the point of a needle be put under one of the poles of a magnet so as to hang by, its head, and present to this head any bar of iron by its upper end, the needle will immediately quit the magnet, in order to adhere to the bar; but if the needle hold by its head to the pole of the magnet, then neither the bar of iron, nor a weak magnet shall disengage it; and there is another slight circumstance which makes an armed and vigorous loadstone appear to have no more force, and that is the too great length of the iron which is to be raised by one of the poles.

In order to communicate the magnetic virtue effectually, these methods are made

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use of. 1. It has been discovered that iron rubbed upon one of the poles of the magnet, acquires a great deal more virtue than from any other part thereof, and this is more considerable from an armed than a naked magnet. 2. The more gently the iron is pressed, and the more it is pressed against the pole, the more magnetical it becomes. 3. It is more convenient to impregnate iron on one pole than on both successively. 4. The iron is much better impregnated by pressing it uniformly, and in the same direction, according to its length, than by rubbing it by the middle; and the extremity which touches the pole last, retains the most virtue. 5. A piece of polished steel, or a bit of pointed iron, receives more virtue than a simple piece of iron of the same figure; and *cæteris paribus*, a piece of iron that is long, small, and pointed, is more strongly impregnated than that of any other form.

The communication of the magnetic virtue does not sensibly impair that of the loadstone; though it has been observed, that some magnets have communicated a greater power to iron to raise weights, than they had themselves, but without impairing their own force, or adding any thing to the weight of the iron.

As several ways have been proposed for recovering the decayed virtue of loadstones, but to little purpose, especially that of keeping the stone constantly in steel filings, we shall here relate the remarkable experiment of Mr. Hæc for this purpose, as it was attended with great success. This gentleman had a magnet weighing fourteen ounces and a half, armed, which would take up sixteen times its own weight; but having laid it by for some years unused, it lost one fourth part of its virtue, or more; whereupon he hung as much weight to the stone as it would sustain, and so left it for some weeks; then returning, he applied more weight to the former, which it very easily bore, and then repeating the addition of more weight at several periods, in the space of about two years, he found that the stone had not only recovered its former strength, but increased it so far, that it would now take up more than twenty pounds, whereas at first it would not take up fifteen.

Artificial MAGNET, a steel bar impregnated with the virtues of the magnet, so as to possess all the properties, and be used instead of the natural loadstone.

There have been several methods proposed for making artificial magnets, but none has yet met with greater success than that of Mr. Canton's, a gentleman well known to the learned world, and to whom we owe this discovery.

Procure a dozen of bars, six of soft steel, each three inches long, one quarter of an inch broad, and one twentieth of an inch thick; with two pieces of iron, each half the length of one of the bars, but of the same breadth and thickness: also six pieces of hard steel, each five inches and a half long, half an inch broad, and three twentieths of an inch thick; with two pieces of iron of half the length, but the whole breadth and thickness of one of the hard bars; and let all the bars be marked with a line quite round them at one end. Then take an iron poker and tongs, (pl XXXI. fig. 1) or two bars of iron, the larger they are and the longer they have been used, the better; and fixing the poker upright between the knees, hold to it, near the top, one of the soft bars, having its marked end downwards, by a piece of sewing silk, which must be pulled tight by the left hand, that the bar may not slide: then grasping the tongs with the right hand, a little below the middle, and holding them nearly in a vertical position, let the bar be stroked by the lower end from the bottom to the top, about ten times on each side, which will give it a magnetic power sufficient to lift a small key at the marked end; which end, if the bar was suspended on a point, would turn towards the north, and is therefore called the north pole, and the unmarked end is, for the same reason, called the south pole. Four of the soft bars being impregnated after this manner, lay the two (fig. 2.) parallel to each other, at the distance of one fourth of an inch, between the two pieces of iron belonging to them, a north and a south pole against each piece of iron: then take two of the four bars already made magnetical, and place them together so as to make a double bar in thickness, the north pole of one even with the south pole of the other; and the remaining two being put to these, one on each side, so as to have two north and two south poles together; separate the north from the south poles at one end by a large pin, and place them perpendicularly with that end downward on the middle of one of the parallel bars, the two north poles towards its south, and

the two south poles towards its north end: slide them backward and forward three or four times the whole length of the bar, and removing them from the middle of this, place them on the middle of the other bar, as before directed, and go over that in the same manner; then turn both the bars the other side upwards, and repeat the former operation: this being done, take the two from between the pieces of iron; and placing the two outermost of the touching bars in their room, let the other two be the outermost of the four to touch these with; and this process being repeated till each pair of bars have been touched three or four times over, which will give them a considerable magnetic power, put the half dozen together after the manner of the four, (fig. 2.) and touch with them two pair of the hard bars placed between their irons, at the distance of about half an inch from each other; then lay the soft bars aside, and with the four hard ones, let the other two be impregnated, (fig. 3) holding the touching bars apart at the lower end near two tenths of an inch, to which distance let them be separated after they are set on the parallel bar, and brought together again before they are taken off; this being observed, proceed according to the method described above, till each pair have been touched two or three times over; but as this vertical way of touching a bar will not give it quite so much of the magnetic virtue as it will receive, let each pair be now touched once or twice over in their parallel position between the irons, (fig. 4.) with two of the bars held horizontally, or nearly so, by drawing at the same time the north of one from the middle over the south end, and the south of the other from the middle over the north end of a parallel bar; then bringing them to the middle again, without touching the parallel bar, give three or four of these horizontal strokes to each side. The horizontal touch, after the vertical, will make the bars as strong as they possibly can be made, as appears by their not receiving any additional strength, when the vertical touch is given by a great number of bars, and the horizontal by those of a superior magnetic power. This whole process may be gone through in about half an hour; and each of the large bars, if well hardened, may be made to lift twenty-eight troy ounces, and sometimes more. And when these bars are thus

thus impregnated, they will give to an hard bar of the same size its full virtue in less than two minutes: and therefore will answer all the purposes of magnetism in navigation and experimental philosophy much better than the loadstone, which is known not to have a sufficient power to impregnate hard bars. The half dozen being put into a case (fig. 5.) in such a manner as that two poles of the same denomination may not be together, and their irons with them as one bar, they will retain the virtues they have received: but if their power should, by making experiments, be ever so far impaired, it may be restored without any foreign assistance in a few minutes. And if, out of curiosity, a much larger set of bars should be required, these will communicate to them a sufficient power to proceed with, and they may in a short time by the same method, be brought to their full strength.

MAGNIFYING, in philosophy, the making of objects appear larger than they would otherwise do; whence convex lenses, which have the power of doing this, are called magnifying glasses; and of such glass are microscopes constructed.

MAGNITUDE, whatever is made up of parts locally extended, or that hath several dimensions; as a line, surface, solid, &c.

The apparent magnitude of a body is that measured by the visual angle, formed by rays drawn from its extremes to the center of the eye; so that whatever things are seen under the same or equal angles, appear equal; and *vice versa*.

MAGNOLIA, the laurel-leaved tulip tree, in botany.

Could this beautiful tree be so far naturalized as to endure the cold of our severe winters, it would make one of the greatest ornaments of our gardens. It is propagated by seeds, which should be procured from Carolina.

MAHOMET, or MAHOMED, a false prophet, and the founder of the Mahometan religion, was born at Mecca, the 5th of May, 571, of poor parents, but of an illustrious family. Abdallah, his father, was an idolater, and his mother was called Emina. He lost his father and mother when very young, and was educated by his uncle Abutaleb, who placed him in the service of Cadigha, the widow of a rich merchant. This woman became in love with Mahomet, and married him when he was twenty-five years of age. He had three sons, who

died young; and four daughters, who were advantageously married. Being subject to the epilepsy, and willing to conceal this infirmity from his wife, he made her believe that he fell into those convulsions merely because he could not support the sight of the angel Gabriel, who came from heaven to inform him of several things concerning religion. He also made the same pretence to his domestics and friends, who soon published abroad that Mahomet was a great prophet, by which means he obtained several disciples. The magistrates of Mecca, alarmed at the discourses, and, fearing lest the novelties should excite a sedition, resolved to have him dispatched; but Mahomet being informed of their design made his escape: from which time the Mahometans reckon the epocha of the Hegira, an Arabic word, which signifies flight. This period is reckoned from the 16th of July, 622. Mahomet retired to Medina with a few friends, but was soon joined by a great number of his disciples. He then discovered to them his designs, which were, to extend his dominion and religion by force of arms. And to inspire them with the greatest courage and intrepidity, he told them, that God having pre-determined the time of every man's life, those who were slain in battle would have died that very moment had they stayed at home; but as they died fighting for the faith, they gained the crown of martyrdom, and the rewards due to it in paradise. His soldiers being thus inspired with an enthusiastic ardor, he easily conquered several tribes of Arabs, took their cities, and brought them under his government and laws. Giving his great standard to his uncle, Hamza, he sent him against the caravans of the country, and had all the success he could wish; for with 319 men he defeated a caravan of 1000 Karashites, and obtained a considerable booty, with the loss of only 40 men. On Mahomet's having taken Cabar, a city inhabited by Arabs of the Jewish religion, he took up his quarters in the house of one of its principal inhabitants, whose daughter preparing a shoulder of mutton for his supper, poisoned it; on eating it, one of his companions fell down dead on the spot; and though Mahomet, not liking the taste, had spit out what he had taken into his mouth, yet he was never well after this supper, and a few years after died of it. The young woman being asked her reason for doing it, answered, that

that she was resolved to try whether he was a prophet or no; for were he a prophet, she thought he would certainly know that the meat was poisoned, and therefore would receive no harm; but if he were not a prophet, she should do the world good service in ridding it of so wicked a tyrant. He however after this took several cities, and among the rest Mecca, when the rest of the Arabs, who had not yet felt his arms, were so terrified at his power, that they all came in; so that in the 10th year of the Hegira, and 631 of our Lord, his empire and religion were established through all Arabia. He then returned to Medina, where he died in the year 633, and the 63d of his age. Mahomet was interred at Medina, and not at Mecca, as is commonly imagined. His tomb is not suspended in the air, but is a stone coffin placed on the floor, in a chapel into which nobody can enter, because it is surrounded with large bars of iron. There is still extant a famous book written by Mahomet, called *Al Koran*, or the Koran, which includes his law and religion. It is certain, and Mahomet confesses it, that his religion was established by conquest, and that the swiftness of its great progress was owing to the success of his arms, which has nothing strange or miraculous in it. No religion or government could be less favourable to the fair sex than Mahometanism; it allowed men to have several wives, to beat them when they would not obey, and to divorce them when they became disagreeable: but he would not allow the women to leave their offended husbands without their consent. In a word, most of his laws with respect to women are very severe.

MAHOMETANS, those who believe and practise the religion of Mahomet. — The fundamental position on which Mahomet erected the superstructure of his religion was, that there has been from the beginning of the world but one true orthodox belief, which consists in acknowledging one only true God, and obeying such of his messengers and prophets as he has from time to time sent into the world to reveal his will to mankind. Upon this foundation he set up for a prophet, to extirpate idolatry, which was the religion of the Arabs, his countrymen, and to reform the other abuses crept into religion. The whole substance of his doctrine he therefore comprehended in these two principal articles of faith, "There is but one God,

"and Mahomet is his prophet:" in consequence of which last article, all such ordinances and institutions as he thought fit to establish, were to be received as obligatory and of divine authority. The Mahometans divide their religion into two general parts, faith and practice; of which the first is divided into six branches, belief in God, in his angels, in his scriptures, in his prophets, in the resurrection and final judgment, and in God's absolute decrees. The points relating to practice are, prayer, with washings; &c. alms, fasting, pilgrimage to Mecca, and circumcision. In regard to these practical points, Mahomet, it is said, declared, that the practice of religion is founded upon cleanliness, which is one half of faith and the key of prayer. Alms-giving is thought to be so pleasing in the sight of God, that the caliph Omar Ebn Abdalaziz used to say, prayer carries us half way to God, fasting brings us to the door of his palace, and alms procures us admission: and Mahomet himself used to say of fasting, that it was the gate of religion; and the odour of the mouth of him who fasteth is more grateful to God than that of musk.

* **MAHON (PORT)** a sea-port town of the island of Minorca, and capital of the country, the English having removed the court of justice thither from Citadella, and made it the seat of government. The buildings are of free-stone, and either covered with tiles, or terraced on the top like floors. The houses of the gentlemen and burghers are built on two or three sides of a quadrangle, and sometimes form a complete hollow square. These are two stories high, but those of the tradesmen and labourers are no more than twelve feet. The streets are generally very narrow, and none of them paved, a naked rock appearing every where. It is seated at a fine bay, at the east end of the island, being a commodious harbour, where the largest fleets may ride secure from tempests and enemies; the entrance being defended by platforms, and very strong forts. It was conquered by the English in 1708, who kept possession till 1757, when the town and the whole island were taken by the French: they were, however, restored to the English by the late treaty of peace. It is one hundred and fifty miles south-east of Barcelona. Long. 4. 25. E. Lat. 39. 54. N.

MAIDEN, an instrument used in Seotland.

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Scotland for beheading criminals. It is a broad piece of iron about a foot square, very sharp on the lower part, and loaded above with a very heavy weight of lead. At the time of execution it is pulled up to the top of a narrow wooden frame, about ten feet high, and as broad as the engine, with mouldings on each side for the maiden to slide in. A convenience is made about four feet from the ground, for the prisoner to lay his neck; and there is a kind of bar so fastened as to keep him from stirring. The prisoner being thus secured, and the sign given, the maiden is let loose, which in a moment separates his head from his body.

MAIDEN ASSIZE, an assize wherein no person is condemned to die.

MAJESTY, a title given to kings.

MAIL, or *Coat of MAIL*, a piece of defensive armour for the body, made of small iron rings interwoven in the manner of a net.

MAIM, or **MAYHEM**, in law, a wound by which a person loses the use of a member that might have been a defence to him.

MAIN, in the sea-language, chief, principal, as the main-mast, main-yard, main-sail, main-hatchway, &c.

MAINPRIZE, in law, the receiving a person into friendly custody, who might otherwise be committed to prison, on security given that he shall be forth-coming at a time and place appointed. There is a difference between bail and mainprize, for a person mainprised is said to be at large from the day of his being mainprised, till the day of his appearance, and is not liable to be confined by his sureties: but when a person is let to bail by a judge, &c. till a certain day, he is in law always accounted in the ward of his bail during the time, who may, if they please, keep him in prison.

MAJOR, in the art of war, the name of several officers of very different ranks; as, 1. Major-general, the next officer to the lieutenant-general: his chief business is to receive the orders from the general, or in his absence from the lieutenant-general of the day; which he is to distribute to the brigade-majors, with whom he is to regulate the guards, convoys, and detachments. When there are two attacks at a siege, he commands that on the left. He ought to be well acquainted with the strength of each brigade of each regiment in particular, and to have a list of all the field officers. In short, he is in the army what a major

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is in a regiment. He is allowed an aid de camp, and has a serjeant and fifteen men for his guard. 2. Major of a brigade, the officer who receives the orders from the major-general, and afterwards delivers them to the adjutants of the regiments at the head of the brigade; where he takes and marches the detachments, &c. to the general rendezvous. He ought to be an expert captain, to know the state and condition of the brigade, and keep a roll of the colonels, lieutenant-colonels, majors, and adjutants. 3. Major of a regiment, the next officer to the lieutenant-colonel, generally promoted from the eldest captain. He is to take care that the regiment be well exercised, to see it march in good order, and to rally it in case of its being broke. He is the only officer among the foot that is allowed to be on horseback in time of action, that he may the more readily execute the colonel's orders, either in advancing or drawing off the regiment. 4. Major of a regiment of horse, is the first captain, who commands in the absence of the colonel. 5. Town major, the third officer in a garrison, being next to the deputy-governor. He should understand fortification, and hath charge of the guards, rounds, patrols, &c. His business is also to take care that the soldiers arms are in good order; he likewise orders the gates to be opened and shut, and gives the governor an account of all that passes within the place. There are also aids-major, drums-major, serjeants-major, &c. so called from their preheminance above others of the same denomination.

MAJOR, in logic, the first proposition of a syllogism.

MAJOR and MINOR, in music, signify imperfect concords, differing from each other by a semi-tone minor.

MAJORANA, marjoram, in botany, a low plant. It is sown annually in gardens, for culinary as well as medicinal uses: the seeds, which rarely come to perfection in England, are procured from the south of France, where the plant is said to be indigenous.

The leaves and tops of marjoram have a pleasant smell, and a moderately warm aromatic bitterish taste. This plant has been chiefly recommended in disorders of the head and nerves, in uterine obstructions and mucous discharges proceeding from what is called a cold cause, that is, from a laxity and debility of the solids, and a sluggish state of the juices, and in

the humoral asthma and catarrhs of old people. The powder of the leaves, thin distilled water, and the essential oil properly diluted, are agreeable erethics, and accounted particularly useful in pituitous obstructions of the nostrils, and disorders of the olfactory organs.

* MAJORCA, a Spanish island in the Mediterranean sea, between the island of Ivica to the west, and that of Minorca to the east. It is about eighty miles south of the coast of Catalonia, and one hundred east of Valencia, and is about sixty miles in length, and forty-five in breadth. It is a mountainous country, and yet abounds in olive trees, delicious wine, and excellent corn. It has no rivers, though there are a great number of springs and wells, as well as several good harbours. The inhabitants are robust, active, and good seamen. It was taken by the Moors in 1219.

* MAJORCA, a large, handsome, rich, and strong town, in the island of the same name, with a bishop's see. It contains about six thousand houses, and twenty-two churches, besides the cathedral. The squares, the cathedral, and the royal palace are magnificent structures. A captain-general resides there, who commands the whole island; and there is a garrison against the incursion of the Moors. It was taken by the English in 1706, but was retaken in 1715, since which time it has been in the hands of the Spaniards. It is seated on the south-west part of the island, where there is a good harbour, one hundred and twenty miles south-east of Barcelona, and three hundred from Madrid. Long. 2. 55. E. Lat. 39. 36. N.

MAJORITY, the greater number of persons.

MAIZE, a species of grain so commonly used for food in America, that it has obtained the name of Indian corn. The size of its ear differs greatly, according to the fertility of the soil, and the warmth of the climate in which it is cultivated; but at a medium, it is about a span long, and commonly has eight or more rows of grain, each of which usually contains upwards of thirty seeds, of various colours, as red, white, yellow, blue, olive, greenish, blackish, speckled, striped, &c. sometimes in the same field and the same ear; but the white and yellow are the most common: nor does this diversity of colours ever reach beyond the outside of the grain, the flower of which always is white, with a little tinge of yel-

low. These seeds, which are as big as large peas, are round at their outer surface, very smooth, and set extremely close, in straight lines. The ear is clothed with several strong thick husks, which defend it not only from unseasonable rains and the cold of the night, for it does not ripen fully in some places, till towards the latter end of September, but also from crows and other birds, which, being allured by the sweetness of the grain before it hardens, flock to it in great numbers, suck through the top of the outer covering, and devour as far as they can reach. In the northern colonies, the stalk of this plant, which contains a remarkably sweet pith, and is jointed like a cane, does not grow near so high as in the southern parts. It has long leaves at every joint, and at the top a bunch of flowers of various colours, highly pleasing to the eye. The northern Indians, far up in the country, have a species of this grain, called Mohawk's corn, which never grows high, and tho' planted in June, ripens in due season. The general time of planting it is between the middle of March and the beginning of June, or more particularly, from the middle of April to the middle of May. This plant is seldom cultivated in England for use, though it might probably turn to good account, as was lately experienced by a gentleman in Lincolnshire, who planted this corn in an open field; where it ripened perfectly, and yielded an abundant crop. Large quantities of it are raised, in Asia and Africa, in several parts of France, in Italy, Germany, and North America. The manner of using this corn in America is various. It has this advantage over wheat, that substance may be drawn from your corn-fields long before the general harvest; for the green ears roasted are delicate food; and as the corn ripens and grows harder, the ears boiled are good eating with butter and salt. When it is ripe, the corn parched and ground into meal is the hunting and war provision of the Indians, being light to carry, and affording good nourishment. They mix a little of it with water, and it requires no other cooking, having already passed the fire in the parching. The grain soaked in water will part with its skin, when beat in a large mortar with a wooden pestle; then it is boiled and eaten with milk. Being pounded coarsely, dry, it is also boiled and eaten as rice. Bag puddings, and baked puddings made

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of it properly, are very good. The meal is also boiled with water, to make what they call a hasty-pudding, which they eat with butter and sugar, or with milk. This hasty-pudding, or boiled meal, being mixed with twice as much dry wheat flower, and worked into loaves, make much better and pleasanter bread than flour alone.

MALACHI, or *the Prophecy of MALACHI*, a canonical book of the Old Testament, and the last of the twelve prophets. Malachi prophesied about three hundred years before Christ, reproving the Jews for their wickedness after their return from Babylon, charging them with rebellion, sacrilege, adultery, prophaneness, and infidelity, and condemning the priests for being scandalously careless in their ministry; at the same time not forgetting to encourage the pious few, who maintained their integrity. This prophet distinctly points at the Messiah, who was suddenly to come to his temple, and to be introduced by Elijah the prophet, that is, by John the Baptist, who came in the spirit and power of Elias or Elijah.

MALACHITES, or **MOLOCHITES**, in natural history, &c. a species of jasper, supposed to be possessed of amuletic virtues.

MALACIA, *malaxia*, in medicine, a languishing disorder incident to pregnant women, in which they long sometimes for one kind of food, and sometimes for another, and eat it with an extraordinary greediness. When women labouring under this disorder begin to abstain from the improper and absurd things they were fond of, and with less reluctance use laudable and wholesome aliments, it is an infallible sign of a beginning cure and approaching health. Pregnant women are generally freed from the malacia, about the fourth month; but if it continues longer it is dangerous, because the peccant humours are deeply rooted. For the cure of this disorder, in pregnant women, but few medicines are recommended for fear of abortion: however gentle medicines may be used for evacuating and corroborating the stomach. In young women labouring under a chlorosis, this distemper is cured by the same medicines that are proper for removing the chlorosis. See *Chlorosis*.

MALACOPTERYGIUS, among ichthyologists, an appellation given to one of the five orders of fishes, from their having the rays of their fins bony, but not pointed or sharp at the extremities, like those of acanthopterygious fishes.

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MALACOSTOMOUS, an appellation given to the fishes that are destitute of teeth in the jaws, called in English leather-mouthed: as the tench, carp, bream, &c.

MALANDERS, in farriery, cracks in the bend of a horse's knee, that discharge a sharp indigested matter; they are often the occasion of lameness, stiffness, and the horse's tumbling. This distemper is cured by washing the parts with a lather of soap warmed, or old chamber-ley; and then applying over the cracks a strong mercurial ointment spread on tow, with which they should be dressed, night and morning, till all the scabs fall off: if this should not succeed, anoint them night and morning with a little of the following; and apply the above ointment over it. Take of Æthiops mineral half an ounce; white vitriol one dram; soft green sope six ounces. Anoint with this often, but first clip away the hair, and clear the scabs. On their drying up, it may be proper to give a gentle purge or two; or the nitre balls may be taken advantageously for a fortnight, or three weeks.

MALE, *Mas*, among zoologists, that sex of animals having the parts of generation without the body. The term male has also, from some similitude to that sex in animals, been applied to several inanimate things: thus we say, a male flower, a male screw, &c.

MALICE, in law, a premeditated design to do mischief or injury to another.

MALIGNANT, among physicians, a term applied to diseases of a very dangerous nature, and generally infectious; such are the dysentery, hospital fever, &c. in their worst stages.

MALLEABLE, a property of metals, whereby they are capable of being extended by being beat with the hammer. See *Ductility* and *Metal*.

MALLEOLUS, in anatomy, a name given by anatomists to the inferior extremities of the tibia and fibula.

MALLET, a kind of large wooden hammer, used by artificers who work with a chissel, as sculptors, masons, and stoncutters, whose mallets are commonly round; and by joiners, carpenters, &c. who work with square-headed mallets.

MALLEUS, in anatomy, a bone of the ear, so called from its resemblance to a mallet.

MALLOW, **MALVA**, in botany. See *Malva*.

MALMSEY, a rich kind of wine, so called, as being brought from Malvasia, in the Morea.

* **MALO**,

* MALO, (St.) Expedition against. In the last war, the English ministry were so far from being dispirited with the bad success of the expedition against Rochfort in the year 1757, that the disappointment seemed to animate them the more. Accordingly, as soon as the season admitted, the army assembled again in the Isle of Wight: it consisted of fifteen battalions, four hundred artillery men, and five hundred and forty light horse, in all thirteen thousand fighting men. They were also provided with sixty pieces of cannon, fifteen of which were twenty-four pounders, and fifty pieces of the mortar kind. On the 23d of May, 1758, Charles duke of Marlborough arrived in the camp as commander in chief, lord George Sackville and the earl of Ancram were the lieutenant-generals; the major-generals were Waldgrave, Mostyn, Drury, Boscawen, and Elliot. The baggage began to be embarked on the 25th, next day the first brigade were put on board their respective transports, and the whole embarkation was finished on the 28th. The troops that were to make the first debarkment were to keep themselves in readiness; to take two days provisions, and a tent for every eight men. The officers that were to command them were to have only private soldiers tents, till they could establish themselves on the shore. Lord Anson and sir Edward Hawke had hoisted their flags at Spithead; but commodore Howe commanded the frigates, and was intrusted with the direction of every thing that related to the landing of the troops in the enemy's dominions. For this purpose a considerable number of flat-bottomed boats, of a new invention, was provided; and nothing was wanting that could be deemed necessary to forward the execution of the enterprise. The weather, during the encampment on the Isle of Wight, had been remarkably pleasant; the men had constant exercise morning and evening. were in good health and spirits, and longed for nothing so much as an opportunity to exert themselves in actual service. The whole nation seemed to be animated with an uncommon degree of alacrity: lord Downe, sir James Lowther, sir John Armitage, Mr. Berkeley, and Mr. Delavel, persons of distinguished rank and fortune, engaged as volunteers in the service, and every lover of his country began to entertain agreeable hopes of the success of the armament, though the designation of it was kept an inviolable se-

cret. It was, however, easily perceived that the intended voyage could not be of any considerable length, because a great number of soldiers were crowded into one transport. This disposition was attended with such inconvenience, that the troops loudly complained they were in danger of being stifled for want of room and fresh air; the whole tonnage of the transports amounting to no more than eleven thousand and eighty-four. To remedy this evil, four hundred men of the guards were taken on board a ship of war, and by this expedient the rest were considerably eased. The soldiers had another subject of complaint, which is but too common with all persons employed by sea for the service of their country. They were put on short allowance of provisions, and even the beef they received was old, hard, salt, and disagreeable. At this period the captain of a French sloop, who had been detached for intelligence, boldly ran up among the fleet at Spithead, and saluted the admiral, as if he had been a subject of England; but he was soon discovered and taken. The enemies vessels were very alert upon the coast of England; for, notwithstanding a great number of cruizers, the French privateers made prizes of some small craft on the back of the Isle of Wight. The proper disposition being made for landing, if it should be thought proper, and every thing prepared for the voyage, the fleet was favoured with a fair wind on Thursday the 1st of June; lord Anson immediately weighed and put to sea with all the ships of war, except those destined as convoy to the transports, under the immediate direction of commodore Howe. By eleven in the forenoon all the transports were under sail; by two o'clock the fleet cleared the Isle of Wight, and stood over to the coast of France, with a fresh gale, which blew all night. In the morning of Saturday, the 3d of June, a great part of the fleet was astern of the commodore, who being to the westward of Alderney brought to off Sark, and dropped anchor in very foul and dangerous ground, where many anchors were lost. The Ward transport, having on board part of the first regiment of guards, drove upon a rock, and fired guns of distress, but, when she was on the point of foundering, all the men were saved in boats, and removed into other vessels. Notwithstanding the repeated signals to make sail, the transports lagged behind, some of them at the distance of five or six

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leagues, otherwise the fleet might have anchored this evening in the Bay of Cancalle, near the place of its destination. At night the commodore weighed and stood off to sea, and on Sunday morning made sail for land. Next day the fleet made St. Malo, and about two in the afternoon stood into the Bay of Cancalle, where some batteries on the land beginning to fire on the cutters, the frigates ran in shore, and a few shot were exchanged. About five in the evening all the grenadiers in the army went on board the flat-bottomed boats for landing; the volunteers accompanied this detachment, and acted with them on all occasions. About seven, Mr. Howe in his own ship, the *Essex*, led the way, and with two others ranging up along-side of a small battery, poured in some broadsides, by which it was effectually silenced, and the whole army landed without any loss, except that of three sailors; nor did they meet with any opposition, but from the random shot of a few straggling peasants. The troops thus landed, marched forthwith in small parties to seize the posts and villages which were situated on high grounds, and rendered very strong by hollow ways, inclosures, gullies, and every natural defence, except water. The field-pieces, being ten light six pounders were likewise landed, and by a mistake of orders drawn into a deep road, where they stuck in the mire, and with great difficulty were brought back to the beach. All night the troops lay on their arms. Next morning, a spot of ground was marked out for a camp, to be fortified with an entrenchment, to secure a retreat for the army; and in the evening six hundred men were set to work upon it. The people in the country, except a few of the aged and infirm, abandoned their houses in the utmost consternation. The army being quite disembarked, the troops encamped on the ground chosen for the entrenchment, on the road from Cancalle to St. Malo. On Wednesday morning the duke of Marlborough and lord George Sackville, with the first column of the army, began their march towards St. Malo. Lord Ancram, at the head of the second column, advanced towards the same place, through the great road by the sea side, to the right of the village of Dol. The brigade of the guards occupied an encampment three miles to the left, on a spot of ground which was the most accessible avenue by which the enemy could fall upon the army. This night

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and next day, a detachment of troops set on fire above one hundred sail of shipping, together with a great number of magazines filled with naval stores, at St. Servand, and Solidore, a kind of suburb, to St. Malo, with a large and open harbour. They likewise took possession of a fort near the point of Parame, which the enemy had abandoned. In the mean time, the brigade left at Cancalle were employed in making the entrenchments, as well as in building two square redoubts, one horn-work, and two batteries, for the defence of eleven thousand and thirty paces of ground. In the rear of the entrenchment were landing-places, with high rocks, and difficult communications towards the shore. The front was covered by a hollow way, flanked with houses, in which loop-holes were made; a little further advanced was a fall of large trees cut down for the purpose. The left was secured by a deep escarpment: the center and the right defended by falls of trees, and the village of Cancalle, of very difficult access. Never was a finer situation for a small army to make a stand against any superiority of number. The three brigades, encamped with the duke of Marlborough at Parame, had no opportunity of acting. The light-horse and out-parties scoured the country, and brought in numbers of prisoners, but there was little prospect of being able to reduce St. Malo. The place is strong by its situation on a peninsula, almost surrounded by the sea, and having no communication with the land, but by a narrow dike of about six or seven hundred yards in length; and it has also two hundred and fifty pieces of cannon mounted on its ramparts. It is true it has no outworks, and its fortifications are such as could not sustain a regular siege for any length of time; but it is strong by nature and art towards the sea. Upon Friday, commodore Howe, with the ships of war and artillery transports, sailed from the bay of Cancalle towards St. Malo, with an intention to land the battering cannon; but the design of a formal siege was then thought impracticable. It would have taken up more time than upon the present plan it would have been prudent to bestow. The artillery could not be landed near the town; nor were there horses sufficient to draw it from any considerable distance: and before regular approaches could have been made, the enemy, in all probability, would have been able to assemble a force much

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much superior to the English army. On these considerations, the general resigned all thoughts of attacking the town by land, and commodore Howe sailed back to the Bay of Cancele. Some letters passed between the duke of Marlborough and the governor of the town, and an exact account was taken of the ships, vessels, storehouses, and magazines, which had been destroyed at St. Servand, whereby it appears that incredible damage was done to the French in this excursion, however they may endeavour to conceal or extenuate the particulars of their loss.

MALT, barley prepared, to fit it for making a potable liquor called beer, or ale, by stopping it short at the beginning of vegetation.

Malt liquors have different names, and different virtues, from the different methods of preparing the malt, whence they are distinguished into pale and brown: and from the various methods taken in brewing the liquors, whence they are divided into ale and beer, strong and small, new and old. See *Brewing*.

The colour of the liquor, and many of its effects, depend on the manner of drying the malt it is brewed with; that which has the palest tinge, is made with malt but slenderly dried; that which is high coloured, is made with malt that is high dried, or roasted as it were, in comparison of the other; and amber ale is made of a mixture of both. Another difference in the preparations of malt-liquors consists in the larger quantity of hops in beer, and the smaller in ale; for hops add something of an alkaline nature to the liquor, and not only render it more easy of digestion, and secretion in the body, but while it is in the liquor, prevent its running into such cohesions as would make it ropy, vapid, and sour. For this reason Dr. Quincy is of opinion, that for one constitution injured by beer, there are numbers spoiled by ale, which is apt to stuff the vessels with slime and viscosity, to make a body unwieldy and corpulent, and to pave the way for cachexies, the jaundice, asthma, and the dropsy. The different degrees of strength in malt-liquors also make them produce different effects. The stronger they are, the more viscid parts they carry into the blood: they are therefore in general the more wholesome for being small: that is, of such a strength as to carry some degree of warmth into the stomach, but not so as to prevent their being proper diluters

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of our necessary food. Indeed people of robust constitutions, who labour very hard, may dispense with reasonable quantities of the strongest; especially as their food is frequently poor and slender, the deficiencies of which this supplies; and their continual exercise and strength of body digests and breaks the viscidities of the drink into convenient nourishment: though in persons of another habit and way of living, they would only produce obstructions and ill humours. As to the age of these liquors, it has somewhat the same effect as hops, for those that are longest kept, are certainly least viscid; for age, by degrees, breaks their viscid parts, and by rendering them smaller makes them fitter for secretion.

Knights of MALTA, called also *Hospitallers of St. John of Jerusalem*, a religious military order, whose residence is in the island of Malta. The order consists of three estates, the knights, chaplains, and servants at arms: there are also priests who officiate in the churches, friar servants, who assist at the offices, and donnes or demicrosses; but these are not reckoned constituent parts of the body: the government of the order is mixt, being partly monarchical, and partly aristocratical: the grand master is sovereign. The knights formerly consisted of eight different languages, but now only seven, the English having withdrawn themselves. None are admitted into this order but such as are of noble birth: the knights are of two sorts, those who have a right to be candidates for the dignity of grand master, called grand crosses, and those who are only knights assistants: they never marry, yet have continued from 1050 to the present time. The knights are received into this order either by undergoing the trials prescribed by the statutes, or by dispensation.

MALVA, common mallow, in botany, a perennial plant, common in uncultivated grounds, and found in flower throughout the summer. The leaves and flowers of the mallow are in taste mucilaginous, and of no remarkable smell. The leaves were formerly of some esteem, as an emollient or laxative dietetic, in dry constipated habits, in the warmer climates; at present, infusions or decoctions of the leaves and flowers, and a conserve made by beating the fresh flowers, with thrice their weight of fine sugar, are sometimes directed in dysuries, heat, and sharpness of urine, and other like complaints; but the principal use of the herb

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is in emollient clysters, cataplasms, and fomentations. They have a soft sweet taste, without any particular flavour, approaching in some degree to that of liquorice: an extract made from them by rectified spirits of wine is of a great sweetness.

MALUS, the apple-tree, in botany, according to Linnæus, a species of the *pyrus*.

MAMMÆ, the breasts, in anatomy, two eminences situated in the anterior, and a little towards the lateral parts of the thorax; their middle part lying almost opposite to the bony extremity of the sixth rib on each side. In children of both sexes, and in males of all ages, they are commonly no more than cutaneous tubercles, or soft verruæ of a reddish colour, called papillæ, or nipples; each of them being surrounded by a small, thin, and pretty broad circle, more or less of a brownish colour, and an uneven surface termed areola. In females, when come to the age of puberty, a third part is joined to the two former, which is a convex protuberance more or less round, of about five or six fingers in breadth, the papilla and areola being situated near the middle of the convex surface. This is what is properly termed the mamma, and it may be called the body of the breast, when compared with the other two parts. It increases with age, and is very large in women with child, and in those that give suck. In old age it decreases and becomes flabby, losing its natural consistence and solidity.

The use of the breasts, in the nourishment of children, is well known to the world: but it is not certainly known what the papillæ and areolæ in men can be designed for. Milk has been observed in them in children of both sexes. *Winslow*.

MAMMILLARY, MAMMILLARIS, in anatomy, an epithet given to two little protuberances, somewhat resembling the nipples of the breast, found under the four ventricles of the brain, and supposed to be the organs of smelling. These are called apophyses mammillares. There is also a muscle called mammillaris, or mastoïdes, serving to support the head.

MAN, *Homo*, in zoology, the chief of the animal part of the creation; making a distinct genus of that order of quadrupeds, which Linnæus calls anthropomorpha, from their resemblance to the human form. The same author distinguishes the race of mankind, according to their different colours, into the Europeans, or

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white men; the Americans, or copper-coloured men; the Asiatics, or tawny-coloured men: and those of Africa, or blacks. *Nosce te ipsum*, know thyself, is a precept worthy of the law-giver of Athens, the ancient seat of polite literature; an important branch of knowledge, which may be reduced to the following heads.

1. In a religious view, *theologicè*, that you was created with an immortal soul, after the image of God.
2. In a moral sense, *morositer*, that you alone was blessed with a rational soul, to be employed to the praise of the Creator.
3. With respect to the other works of the creation, *naturaliter*, that you are constituted their lord, for whose use they were made.
4. In a physiological sense, *physiologicè*, the most perfect and amazing fabric of your body.
5. With regard to diet, *diæteticiè*, what things are useful, and what hurtful, in this respect.
6. In a pathological sense, *pathologicè*, how frail you are, and how subject to a thousand calamities. These are the heads, which, according to Linnæus, comprehend the knowledge of man, considered as an individual; a branch of knowledge so essential to the human race, that, without it, he seems to doubt whether any other characters are sufficient to entitle one to be ranked among mankind: for he adds, *Hæc si novisset, Homo, es, et a reliquis animalibus distinctissimum genus*.

* **MAN**, an island in the Irish sea, thirty-five miles west of the coast of Cumberland, and twenty-eight north of the island of Anglesey in North-Wales, ten south of the coast of Galloway in Scotland, and forty east of the coast of Down, in Ireland; whence it may be seen from England, Scotland, and Ireland. It is near thirty miles in length, and nine in breadth, containing seventeen parishes. The chief towns are Ruthin, Douglas, and Peel. The soil is good, consisting of arable and pasture, and is more than sufficient for the subsistence of the natives. The air is very healthful, the people here living to a very great age. They are a mixture of English, Scotch and Irish, and subject to the king of Great-Britain. Their staple commodities are wool, hides, and tallow. This island has a bishop, suffragan to York, styled Soder and Mann, but he is no lord of parliament. Man lies in 4 deg. 30 min. W. Long. and between 53 deg. 53 min. and 54. 25. N. Lat.

MANATI, in zoology, an animal called by Linnæus *thricechus*.

• **MAN-**

• **MANCHESTER**, a very large and populous town in Lancashire, with a market on Saturdays, and three fairs; on Whit-Monday, September 21, and November 6, for horses, horned cattle, bedding, cloth and toys. It is seated between the rivers Irk and Irwell, upon a stony hill, and is a place of great antiquity. It is now a flourishing town, and has several curious manufactures, known in London by the name of Manchester goods. Their velvets of late are come to great repute. Its chief ornaments are the college, the market-place, and the collegiate church; which last has a small choir, of excellent workmanship. It has an additional church, which was begun in queen Anne's reign, and finished in 1723. It sends no members to parliament; but has the title of a duchy. It is sixty-seven miles west-south-west of York, thirty-nine east-north-east of Chester, and one hundred and eighty-two north-north-west of London. Long. 2. 12. W. Lat. 43. 27. N.

MANDAMUS, in law, a writ issuing out of the King's-Bench, sent to a corporation, commanding them to admit or restore a person to his office.

MANDARINS, a name given to the magistrates and governors of provinces in China, chosen out of the most learned men, and whose government is always at a great distance from the place of their birth. Mandarin is also a name given by the Chinese to the learned language of the country; for besides the language peculiar to every province, there is one common to all the learned in the empire, which is in China what Latin is in Europe; this is called the Mandarin tongue, or the language of the court.

MANDATE, in law, a judicial commandment to do something.

MANE, the hair hanging down from a horse's neck.

MANEGE, or **MANAGE**, the exercise of riding the great horse, or the ground set apart for that purpose; which is sometimes covered, for continuing the exercise in bad weather; and sometimes open, for giving more liberty and freedom both to the horseman and horse.

MANES, in the pagan system of theology, a general name for the infernal deities, or gods of hell. The ancients comprehended under manes not only Pluto, Proserpine, and Minos, but the souls likewise of the deceased were taken into the number, and esteemed gods of hell. It was usual to erect altars and offer liba-

tions to the manes of deceased friends and relations.

MANGO Tree, in botany, the name of a vast tree, forty feet in height, and eighteen in thickness, spreading its numerous branches all around at a great distance, being always green, and bearing fruit once or twice a year, from six or seven years old to an hundred. It is propagated by incision, or sowing the seed, in Malabar, Goa, Bengal, Pegu, and many other countries in the East-Indies. The fruit is of a round oblong figure, flat, slightly sinuated, or hollowed at the sides, and shaped much like a kidney, larger than a goose egg, smooth, shining, first green speckled with white, then inclining to yellow, and at last of a gold-colour: it has a yellowish and succulent pulp, not unlike that of a peach; or rather a plum, first acid, then acidodulcid, and pleasant to the taste. Within the pulp is contained an oblong, compressed, and languanous stone, thin, yet very hard and tenacious, and including a callous oblong kernel, very like an oblong almond, and of the same bigness, and of a bitterish, though not unpleasant taste. There are various sorts of this fruit, as there are of our apples and pears, which are very different, according to the countries where they grow: that species which is without a stone, and is very grateful to the palate, seems to us only a variety, or a degenerate fruit. The fruit is cut into slices, and eaten either without wine, or macerated in wine; it is also candied, in order to its preservation. Sometimes they open it with a knife, and fill up the middle with fresh ginger, garlic, mustard, and salt, with oil or vinegar, that they may eat it with rice, or after the manner of pickled olives. As to its temperament, this fruit is cold and moist, though the Indian physicians affirm the contrary. We use pickled mangoes, which are imported to us, as we do pickled cucumbers, for sauce to roasted meat. The stones roasted are said to cure a looseness, which Garcias found to be true. The wood of the tree, with cinders, is used for burning the carcases of the pagans, as being consecrated to this rite; whence it serves also for coffins, in which they reposit their dead; it is but of a soft substance, and of short duration. The stalks supply the place of arequa or caunga, in the chewing of betel; the same, calcined and reduced to powder, take away warts. Of the tender leaves, with the bark of the avanacoe, that is,

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the ricinus, the seed of cummin and parpadogam, is made a decoction, which is highly beneficial in the cough, asthma, and other affections of the thorax. The bark of the tree pulverised, and taken in chicken-broth, is an excellent dissolvent of extravasated and coagulated blood, occasioned by a fall, in any part of the body. The juice of the bark, with the white of an egg, and very little opium, taken inwardly, is a present remedy against the diarrhoea, dysentery, and tenesmus. Of the gum of the tree, and the flowers of rice, with the addition of a small quantity of opium and pepper, are prepared pills, which also cure all sorts of fluxes of the belly. Of the flower of the dried kernels the natives have the art of preparing various kinds of food.

MANGANESE, MAGNESA, in natural history, a poor kind of iron ore. It is a dense, heavy substance in its finest pieces; being composed of a number of broad and thick striae irregularly laid together, and much resembling those of native antimony; in these masses it is sometimes reddish, sometimes of a dark grey, and sometimes of a fine pale light grey, approaching to the colour of the finest polished iron: but there is a less perfect kind, in which the whole mass seems only to consist of a number of irregularly finished pieces, of a brittle and somewhat glossy ore, blended very loosely together.

Manganese is found in great abundance in the German and Swedish mines, as also in France, Italy, and England; but ours is not equal in beauty or goodness to the German.

MANICORDON, or MANICHORD, a musical instrument resembling a spinnet; the strings of which, like those of the clarichord, are covered with little pieces of cloth, to deaden, as well as to soften their sound; whence it is also called the dumb spinnet. It is much used in nunneries, because the nuns may play upon it without disturbing that silence which they are obliged to observe in their cells.

MANIFESTO, a public declaration made by a prince in writing, shewing his intentions to begin a war, or other enterprise, with the motives that induce him to it.

MANILLE, in commerce, a large brass ring in the form of a bracelet, either plain or engraven, flat or round. Manilles are carried by the Europeans to the coast of Africa, and exchanged for slaves. These people wear them as ornaments on

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the small of the leg, and on the thick part of the arm above the elbow.

MANIPULUS, among physicians, signifies a handful of herbs or leaves, or so much as a man can grasp in his hand at once; which quantity is frequently denoted by the abbreviation, *M*, or *m*.

MANNA, in the materia medica, a sweet juice obtained from certain ash trees in the southern parts of Europe, particularly in Calabria and Sicily; exuding from the leaves, branches, or trunk of the tree, and either naturally concreted, or exsiccated and purified by art. Juices of the same nature are collected, in the Eastern countries, from other trees and shrubs: and similar exudations are sometimes found on different kinds of trees in Europe, particularly on the larch in the Briançonois in Dauphiny. How far the manna juices of different vegetables differ from one another, is not well known; but this much is certain, that one and the same tree affords mannas very considerably different, in their colour, in their taste, and in their disposition to assume a solid concrete form: that is, in their purity, or the greater or less admixture of oily or resinous matter.

The best sort of the officinal or Calabrian manna is in oblong pieces or flakes, moderately dry, friable, very light, of a whitish or pale yellow colour, and in some degree transparent. The inferior kinds are moist, unctuous and brown. Both sorts are said to be sometimes counterfeited by compositions of sugar, honey, and purgative materials: compositions of this kind, in a solid or dry form, may be distinguished by their weight, compactness, and untransparency; both the dry and moist compositions may be distinguished by their taste, which is sensibly different from that of true manna, and with greater certainty by their habitude to menstrua.

Manna, in doses of an ounce and upwards, proves a gentle laxative: it operates in general with great mildness, so as to be safely given in inflammatory or acute distempers, where the stimulating purgatives have no place. It is particularly proper in stomachic coughs, or those which have their origin in the stomach; the manna, by its sweetness and unctosity, contributing to obtund as well as to evacuate the offending humours: in this intention it is sometimes made into a linclus or lohoch, with equal quantities of oil of almonds and of syrup of violets.

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In some constitutions, however, it acts unkindly, especially if given in considerable quantity, occasioning flatulencies, gripes and distensions of the belly; inconveniences which may be generally obviated by a small addition of some grateful aromatic.

MANNER, in painting, a habitude acquired in the three principal parts of painting, the management of colours, lights, and shadows, which is either good or bad, according as the painter has practised more or less after the truth, with judgment and study. But the best painter is he who has no manner at all. The good or bad choice he makes is called *goute*.

MANNERS, in poetry, the inclinations, genius, and humour, which the poet gives to his persons, and whereby he distinguishes his characters. See **CHARACTER**.

MANOMETER, or **MANOSCOPE**, an instrument to shew or measure the alterations in the rarity or density of the air.

MANOR, an ancient royalty or lordship, formerly called a barony, consisting of demesnes, services, and a court-baron; and comprehending in it messuages, lands, meadow, pasture, wood, rents an advowson, &c. It may contain one or more villages, or hamlets, or only a great part of a village, &c. A manor is a noble kind of fee, granted in part to tenants for certain services to be performed, and partly reserved to the use of the lord's family, with jurisdiction over the tenants, for their farms or estates. There are capital manors or honours that have other manors under them; and also customary manors granted by copy of court-roll, the lords of which have power to hold courts, and grant copies, &c.

MANSION, in law, the chief dwelling-house of a lord within his fee, or the capital messuage or manor-house.

* **MANSION-HOUSE**, for the residence of the lord-mayors of London, was founded October 23, 1739; and inhabited in 1752.

MANSLAUGHTER, killing a person without premeditated malice.

MANTLE, or **MANTLE-TREE**, in architecture, the lower part of the chimney, or that piece of timber which is laid across the jaumbs, and sustains the compartment of the chimney-piece. See **CHIMNEY**.

MANTLE, or **MANTLING**, in heraldry, that appearance of folding of cloth, flourishing or drapery, in any achievement.

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ment drawn about the coat of arms. It is supposed originally to be the representation of a mantle, or military habit, worn by the ancient cavaliers over their armour to preserve it from rust. The mantle is always said in blazonry, to be doubled, that is, lined throughout with one of the furs, as ermin, pean, vary, &c.

* **MANTUAN**, a duchy in Italy, bounded on the north by the Veronese, on the west by the Cremonese, on the south by the duchies of Reggio, Modena, and Mirandola; and on the east by the Ferrarese. It is fifty miles long, and forty broad. The river Po, which runs through this duchy, procures it very considerable advantages, but at the same time often does considerable damage by overflowing its banks. It produces but little wine, but has very fine flax, corn, silk, pastures, and excellent fruit. The revenues of the sovereign are computed at three hundred thousand crowns a year. It was enjoyed by the family of Gonzaga, till the last duke, adhering to the French and Spaniards, was put under the ban of the empire, and the duchy was seized upon as a forfeited fee; and the duke dying in 1708, without heirs, the emperor Charles VI. took it into his own possession, though the investiture was demanded by the duke of Guastalla as the nearest relation. After the death of that emperor, in 1740, the archduchess, his eldest daughter, queen of Hungary, kept it in her own hands as heiress of the house of Austria.

MANTUA, the capital of the duchy of the same name, is seated in the middle of a lake formed on the river Mincio. The way into the city is by two bridges over the lake which surrounds it. It is a very large city, having eight gates, eighteen parishes, forty religious houses for both sexes, a quarter possessed by the Jews, and above sixteen thousand inhabitants. The streets are broad and strait, and the houses well built, among which are a great number of palaces. Mantua is now one of the strongest places in Europe, for which reason the allies durst not undertake the siege in 1734, though they were in possession of a considerable part of the duchy. They have a manufactory of silk, which is much decayed. The famous poet Virgil was born at the village of Andes, about two miles from Mantua, and Tasso was born within the walls. The bishopric is immediately subject to the pope. Besides the lake it is surrounded by a morass, which renders it

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it extremely difficult of access. It is thirty-four miles north-east of Parma, twenty west of Verona, and ninety north-by-west of Florence. Long 11. 10. E. Lat. 45. 31. N.

MANUFACTURER, one who works up a natural product into an artificial commodity.

MANURE, any thing used for fattening and improving land. There are various kinds of manure used in different parts of England for enriching the several soils, some of which have been already mentioned under the articles dung, chalk, lime, clay, &c. which see: but there are others that might be used on many lands with success.

MANUSCRIPT, a written book, in contradistinction to a printed one. See *Book*.

MAP, a plane figure representing the surface of the earth, or a part thereof, according to the laws of perspective; distinguishing the situation of cities, mountains, rivers, &c. In maps, these three things are essentially requisite. 1. That all places have the same situation and distance from the great circles therein, as on the globe, to shew their parallels, longitudes, zones, climates, and other celestial appearances. 2. That their magnitudes be proportionable to the real magnitudes on the globe. 3. That all places have the same situation, bearing, and distance, as on the earth itself. Maps are either universal, which exhibit the whole surface of the earth; or particular, which exhibit some particular part thereof: each kind is called geographical or land-maps, in contradistinction to hydrographical or sea-maps, representing the seas and sea-coasts, properly called charts. As a map is a representation of some part of the surface of the earth delineated upon a plane; the earth being round, no part of the spherical surface of it can be accurately exhibited upon a plane, and, therefore, some have proposed the making of globular maps; for this purpose, a plate of brass might be hammered, or at a less expence a piece of paste-board might be formed into a segment of a sphere, and covered on its convex side with a map projected in the same, as the papers of the common globes are: a map made in this method would shew every thing in the same manner, as it would be seen upon a globe of the same diameter with the sphere upon the segment of which it was delineated: and, indeed, maps of this sort would be in effect seg-

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ments of such a globe, but they are not in common use.

The modern general maps are such as give us a view of an entire hemisphere, or half of the globe; and are projected upon the plane of some great circle, which terminates the projected hemisphere, and divides it from the other half of the globe, as the equator, or the meridian, or horizon of some place: from this circle the projection is denominated, and said to be equatorial, meridional, or horizontal.

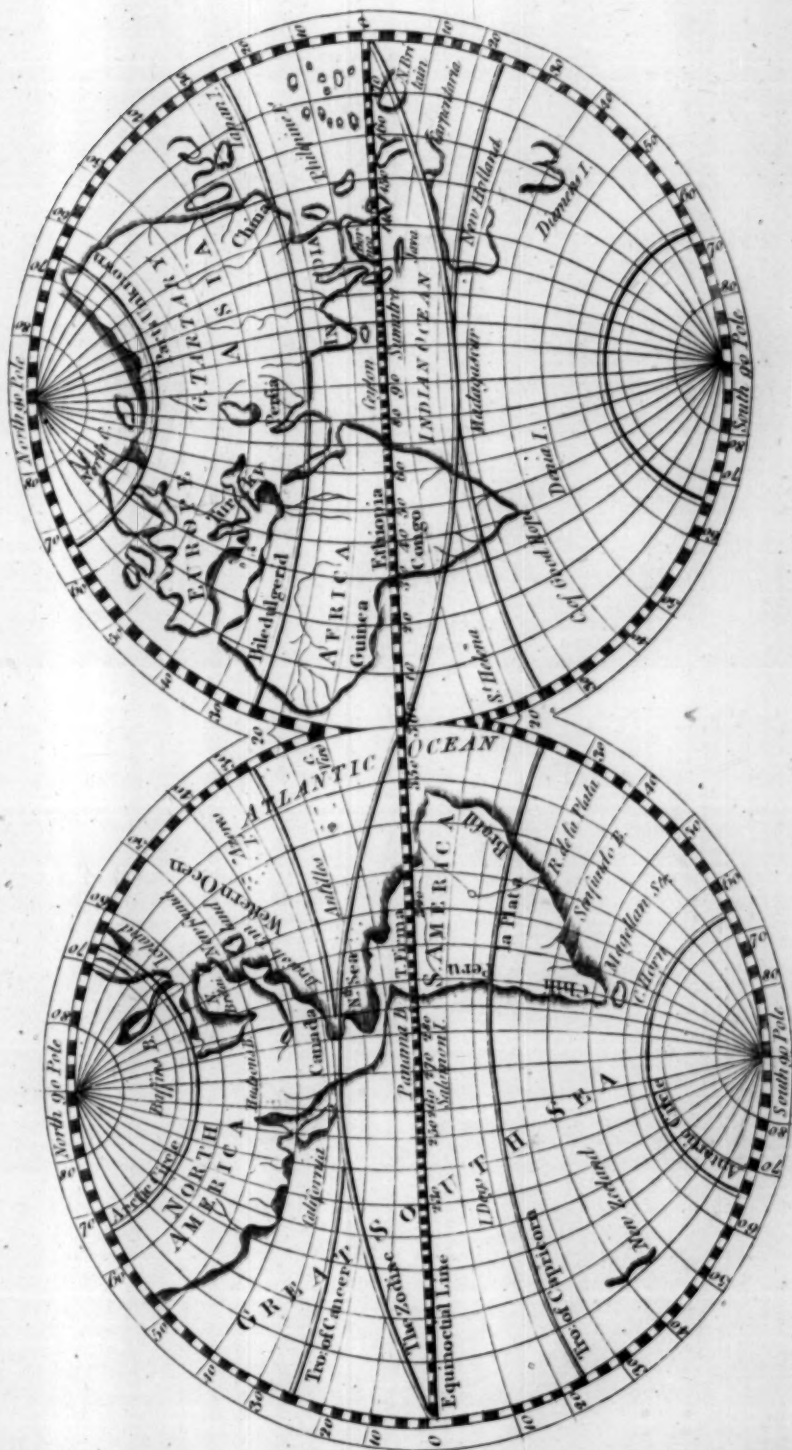
Particular maps are such as exhibit to us less than an hemisphere; of this sort are maps of the great parts into which the earth is divided, as Europe, Asia, Africa, North-America, South-America; or maps of particular kingdoms, provinces, countries, or of lesser districts.

The meridional projection supposes the eye to be in some point of the equator, and from thence to view the opposite concave hemisphere, projected upon a glass plane passing through some meridian, which a meridian drawn through the eye cuts at right angles. Thus plate XXXII. is a map of the earth in two hemispheres; projected upon the plane of a meridian passing through one of the Canary-islands called Ferro. This meridian is made choice of, because, by making the projection thereon, one hemisphere contains Europe, Asia, and Africa; and the other North and South America. Here all the meridians are arches of circles, except that drawn through the eye, which is a straight line; and all the parallels are arches of circles, and the equator is a straight line.

The use of maps is obvious from their construction. The degrees of the meridians and parallels shew the longitude and latitude of places; their bearings from each other appear from inspection; and their distances may be measured by the divisions on the meridian, equator, &c.

MAPLE, *Acer*, in botany, a genus of plants, the flower of which is composed of five oval petals; the fruit consists of a number of capsules, which grow together at the base; and are compressed, roundish, and each terminated by a very large membranous ala; the seeds are single and roundish.

Great MAPLE, *acer majus*, improperly called sycamore, a large tree with pentangular serrated leaves; producing small greenish flowers; and a fruit composed of two capsules, including, each, a whitish seed at the end where they are joined, and spread.





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spreading at the opposite end into a membranous wing. It is a native of the mountains of Switzerland and Austria, and now common in England. These trees are propagated by sowing the seeds, soon after they are ripe, in an open bed of common earth, covering them about half an inch thick, with sandy light earth: the spring following they will appear above ground, and, if kept clear from weeds, will grow above a foot high the first summer: the Michaelmas following, if they are thick in the seed-bed, you may take out a part of them, and transplant into a nursery, in rows at three feet distance, and two feet asunder in the rows; in which place they may remain three or four years, when they will be large enough to plant out for good. The timber of the common maple is far superior to the beech for all uses of the turner, particularly dishes, cups, trenchers, and bowls; and when it abounds with knots, as it often does, it is highly esteemed by the joiners for inlayings, &c. and also, for the lightness of the wood, is often employed by those that make musical instruments; and, for its whiteness is in great request for tables. All the parts of the maple contain a sweet saccharine juice; which exuding on the surface of the leaves, renders them subject to be preyed on by insects. The roots, trunk, or branches, wounded early in the spring, bleed a large quantity of clear liquor; which, in its dilute state, tastes somewhat sweetish; and, on being inspissated, yields a brown-coloured concrete sugar, with a syrupy matter resembling melasses, the juice unboiled has been drank as an anti-scorbutic. The sugar and melasses which are less sweet than those extracted from the sugar-cane, and whose sweetness is likewise somewhat different in kind, are supposed to be more medicinal in disorders of the breast. Considerable quantities of this sugar, made from a species of maple in Canada, are imported for that use into some parts of Europe, particularly France.

MARBLE, *Marmor*, in natural history, a genus of fossils, being bright and beautiful stones, composed of small separate concretions, moderately hard, not giving fire with steel, fermenting with, and soluble in acid menstrua, and calcining in a slight fire.

The colours of marbles being a very obvious and striking character, they are arranged according to them, in the following divisions. 1. Of the white plain marbles there are two sorts; the Parian

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marble of the ancients, and statuary marble of the moderns, an extremely bright and elegant marble; and the Carrara marble; a very fine marble, more compact and close than the former, but less bright. 2. Of the plain yellowish marbles there is only one sort, which is a hard, pale yellow, and glossy marble, found in many parts of Italy. 3. Of the bluish and black marbles there are a great many species, as the Chian marble, Basaltes, &c. 4. Of the plain green marbles there is only one kind, the Lacedemonian marble of the ancients. 5. The pale-coloured or whitish brown, commonly called Darby marble. 6. The green marbles with shells. 7. The black Coralloide marble, with and without shells. 8. Of the white variegated marble there are a great many species, variegated with purple, brown, red, blue, &c. 9. Of the brown variegated marbles there are likewise several sorts, some with red veins; others with white, black, or brown veins. 10. Of the yellow veined and variegated marbles some are veined with purple, and others with blue. 11. Of the black variegated marbles, some are veined with white, and others with blue, yellow, red, &c. 12. The green variegated marbles are likewise distinguished by the colour of their veins. 13. The grey spotted marbles are variegated, some with black and others with green spots. 14. The red variegated marble is the Brocatello of the Italians, with white and gold veins.

Polishing of MARBLE is performed by first rubbing them well with a free-stone, or sand, till the strokes of the axe are worn off, then with pumice-stone, and afterwards with emery.

Colouring of MARBLE. The colouring of marble is a nice art, and in order to succeed in it, the pieces of marble, on which the experiments are tried, must be well polished, and clear from the least spot or vein. The harder the marble is, the better it will bear the heat necessary in the operation; therefore, alabaster and the common soft white marble are very improper to perform these operations upon. Heat is always necessary for the opening the pores of the marble, so as to render it fit to receive the colours; but the marble must never be made red-hot, for then, the texture of the marble itself is injured, and the colours are burnt, and lose their beauty. Too small a degree of heat is as bad as too great; for in this case, though the marble receive the colour,

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lour, it will not be fixed in it, nor strike deep enough. Some colours will strike even cold, but they are never so well sunk in as when a just degree of heat is used. The proper degree is that which without making the marble red, will make the liquor boil upon its surface. The menstruums used to strike in the colours, must be varied according to the nature of the colour to be used. A lixivium made with horse's or dog's urine, with four parts quick-lime, and one part pot-ashes, is excellent for some colours; common ley of wood-ashes does very well for others: for some, spirit of wine is best; and, for others, oily liquors, or common white-wine.

The colours which have been found to succeed best with the peculiar menstruums, are these: stone-blue dissolved in six times the quantity of spirit of wine, or of the urinous lixivium; and that colour which the painters call litmouse, dissolved in common ley of wood-ashes. An extract of saffron, and that colour made of buckthorn berries, and called by the painters sap green, both succeed well dissolved in urine and quick-lime, and tolerably well in a spirit of wine. Vermilion and a fine powder of cochineal, succeed also very well in the same liquors. Dragon's blood succeeds very well in spirit of wine, as does also a tincture of logwood, in the same spirit. Alkanet root gives a fine colour, but the only menstruum to be used for this is oil of turpentine: for neither spirit of wine, nor any lixivium, will do with it. There is another kind of sanguis draconis called dragon's blood in tears, which, mixed with urine alone, gives a very elegant colour. *Philos. Transact.* N^o 268.

Besides these mixtures of colours and menstruums, there are some colours which are to be laid on dry and unmixed. These are dragon's blood, of the purest kind, for a red; gamboge for a yellow; green-wax for a green; common brimstone, pitch, and turpentine, for a brown colour. The marble, for these experiments, must be made considerably hot, and then the colours are to be rubbed on dry in the lump. Some of these colours, when once given, remain immutable; others are easily changed or destroyed. Thus the red colour given by dragon's blood, or by a decoction of logwood, will be wholly taken away by oil or tartar, and the polish of the marble not hurt by it.

A fine gold colour is given in the following manner: take crude sal armoniac, vitriol, and verigrise, of each equal quantities; white vitriol succeeds best,

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and all must be thoroughly mixed in fine powder.

The staining of marble to all the degrees of red or yellow, by solutions of dragon's blood or gamboge, may be done by reducing these gums to powder, and grinding them, with the spirit of wine, in a glass mortar; but, for smaller attempts, no method is so good as the mixing a little of either of these powders with spirit of wine, in a silver spoon, and holding it over burning charcoal. By this means a fine tincture will be extracted, and, with a pencil dipped in this, the finest traces may be made on the marble, while cold, which, on the heating it afterwards, either on sand, or in a baker's oven, will all sink very deep, and will remain perfectly distinct in the stone.

Arundelian MARBLES, ancient marbles with a chronicle of the city of Athens inscribed on them, many years before our Saviour's birth; presented to the university of Oxford by Thomas earl of Arundel, whence the name.

MARBLING, the method of preparing and colouring the marbled paper. There are several kinds of marbled paper; but the principal difference of them lies in the forms in which the colours are laid on the ground: some being disposed in whirls or circumvolutions; some in jagged lengths; and others only in spots of a roundish or oval figure. The general manner of managing each kind is, nevertheless, the same; being the dipping the paper in a solution of gum tragacanth, or, as it is commonly called, gum-dragon; over which the colours, previously prepared with ox-gall and spirit of wine, are first spread.

Marbling of books or paper is performed thus: dissolve four ounces of gum arabic into two quarts of fair water; then provide several colours mixed with water in pots or shells, and with pencils peculiar to each colour, sprinkle them by way of intermixture upon the gum-water, which must be put into a trough, or some broad vessel; then with a stick curl them, or draw them out in streaks, to as much variety as may be done. Having done this, hold your book or books close together, and only dip the edges in, on the top of the water and colours, very lightly; which done, take them off, and the plain impression of the colours in mixture will be upon the leaves; doing as well the ends as the front of the book in the like manner.

Marbling a book on the covers is performed by forming clouds with aqua fortis,

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fortis, or spirit of vitriol mixed with ink, and afterwards glazing the covers. See *Book Binding*.

MARCASITES, *Marchasite*, in natural history, compound inflammable metallic bodies of a hard and solid substance, of an obscurely and irregularly foliaceous structure, of a bright glittering appearance, naturally constituting whole strata, though sometimes found in detached masses; very freely giving fire with steel; not fermenting with acid menstruums; and when put into the fire, yielding a blue sulphureous flame, and afterwards calcining into a purple powder. There are only three known species of this genus: 1. The silver-coloured marcasite, found in vast abundance in lead and tin-mines. 2. The gold coloured marcasite. 3. The heavy pale-white marcasite. Marcasites were at first supposed to be almost all pure gold or silver, according to their colour; but experience has shewn, that if they contain any metal at all, no method has hitherto been found of working them to advantage. In Germany, indeed, they extract sulphur and vitriol from the silver marcasite, which two substances are always contained in it; and besides these, it has usually a quantity of arsenic. It has been recommended as a styptic, after being calcined; but as the arsenic may not be all carried off by that operation, its use as a medicine seems extremely dangerous.

MARCGRAVE, or **MARGRAVE**, a degree of honour in Germany corresponding to our marquis. See *Marquis*.

MARCH, in chronology, the third month of the year, consisting of thirty-one days.

MARDIKERS, or **TOPASSES**, a mixed breed of Dutch, Portuguese, Indians, and other nations, incorporated with the Dutch at Batavia, in the East Indies.

MARE, the female of the horse-kind.

Such mares as are designed for breeding, should be as free from defects as possible, and should, no more than the stallions, have either moon-eyes, watery eyes, or blood shot eyes; they should have no splint, spavin, or curb, nor any natural imperfection: for the colts will take after them: but choice should be made of the best and ablest, the most high-spirited, best coloured, and finest shaped; and the natural defects that may be in the stallion, should be amended in the mare, as well as that which is amiss in the mare should be amended in the stallion.

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* **MARGARET** of *Anjou*, afterwards queen of England, was the daughter of Rene of Anjou, king of Sicily, Naples, and Jerusalem, and was born the 23d of March, 1419. Henry VI. fell in love with her, on seeing her picture, and though her father did not possess an inch of land in the three kingdoms whence he received his titles, he resolved to marry her; and instead of receiving a fortune with this lady, gave her father the duchy of Anjou and the county of Maine, provinces which then belonged to England. The marriage was celebrated at Nancy, in 1444, with great magnificence; after which Margaret immediately embarked for England, and was received with as great marks of joy. She was crowned at Westminster, the 30th of May, 1445: and the duke of Gloucester, the king's uncle, governing the kingdom for the young king, and being beloved of the people, she had him accused of several crimes, thrown into the Tower, and privately murdered. Margaret then took upon herself the administration of affairs, and chose for her assistant the earl of Suffolk, whom she created a duke: that nobleman, who had been the agent of her marriage, had ever since enjoyed her most intimate confidence, but was hated by the people, who attributed the death of the duke of Gloucester to him; and being impeached by the house of commons, the queen made him embark privately for France, but he was murdered in his passage, and the duke of Somerset succeeded him in the queen's favour. The duke of York, who had just pretensions to the crown of England, being descended from Richard II. to try the disposition of the people, set up one Cade, who assumed the name of Mortimer, earl of Marche, who had been beheaded: this pretender defeated the troops that opposed him, the king retired into Kenilworth-castle, and Cade entered London without resistance; but the king, publishing an amnesty, Cade was abandoned by all his men in one night, and soon after killed by a gentleman of Kent. Sometime after the queen was brought to bed of a prince, who was named Edward; and to persuade the people that they intended to correct the disorders that had crept into the administration, the duke of York was invited to court; where having twice appeared, he caused the duke of Somerset to be arrested in the queen's chamber, and sent to the Tower; he then vindicating what he had done before

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before the parliament, was declared lord protector of the kingdom, during the minority of the young prince. This struck the queen with consternation. She at first seemed to submit, till at length the duke of York being called to appear before an extraordinary council, was, to his great surprise, informed that the king having recovered his health, his office of protector, which was only founded on the king's weakness, ceased of course. He perceived that this was only an artifice of the queen, to get the government into her hands; and the first effect of this change, was the release of the duke of Somerset, who, with the queen, were masters of the king's person. Upon this the duke raised an army in Wales, and a battle was fought at St. Albans; where the bravery of the earl of Warwick, who commanded the vanguard, obtained an entire victory. Somerset was slain, the king taken prisoner, and conducted by the duke to London. The parliament now declared the duke of York protector of England, and Margaret retired almost alone to Greenwich, but soon regained her authority by the same stratagem, the pretended recovery of the king. After which she took a tour through several counties, in order to gain the respect and love of the people, by her condescending and obliging behaviour. While the queen was rejoicing at the retreat of her enemies, a terrible storm was formed against her. The earl of Salisbury and the earl of Warwick, raised an army in Kent, and without mentioning the duke of York, declared by a manifesto, that they took up arms merely to secure the liberties and privileges of the people. This procured them an army of 40,000 men; and a bloody battle was fought the 12th of July, 1463, in which the queen fled with the young prince of Wales, and the duke of Somerset; while the king, who had not left his tent, was taken by the earl of Warwick, and conducted to London. The earl of Salisbury now sent to Ireland, to invite the duke of York to come and take possession of the crown; but on his arrival at London, he did not find the parliament ready to second his designs: but an act was passed by the two houses, that Henry, during his life, should continue in possession of the throne, and be succeeded by the duke. Margaret, while her son was thus deprived of his claim to the crown, was at Durham, with a retinue composed of eight persons, who were rather domestics

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than counsellors. She had sent the duke of Somerset into France to solicit succours. She was without money, without an army, and almost without hope; and in this deplorable situation she received orders to return to London. In this dilemma, she hastily left Durham, after having spread the report that she was going to France, and went to the estate of the lords Roos and Clifford, in Yorkshire, travelling chiefly in the night; and by their assistance, together with that of the earl of Devonshire, she raised an army of 25,000 men, with which she encamped near Wakefield. The duke of York and earl of Salisbury marched against her with 20,000 men; but not daring to keep the field, shut themselves up in Sandal-castle, waiting for the arrival of the forces the earl of March was to bring from Wales. The queen incessantly defied him, and reproached him who could venture to aspire to the throne, with cowardly hiding himself for fear of a woman; and then posted 15,000 men behind a hill. The duke thinking that her forces were divided, marched out; but soon perceived his imprudence, and died fighting like a lion. His head being afterwards cut off, the queen had it placed by her, and having kept it the rest of the day, caused it to be fixed on the walls of York. The earl of Salisbury, who had been taken prisoner, was by the queen's order, beheaded. The earl of Warwick, who staid in London to guard the king, now advanced to meet the queen, and obliged the king to go with him; but the queen put the earl to flight, and the king recovered his liberty. But Warwick joining the earl of March, advised him to go directly to London, and be crowned there; he did so; and was proclaimed king the next day in that city, under the name of Edward IV. on which the Queen, who thought to have entered the capital in triumph, found herself plunged in new misfortunes. Edward immediately marched towards York, where he was informed that Henry and Margaret expected him, and the two armies meeting, a bloody battle was fought on Palm Sunday, in which the bravery of the earl of Warwick fixed the victory, and it is said the number of the slain amounted to 40,000. She fled, with her husband, into Scotland; from whence she sailed to France, and met with a kind reception from Lewis XI. She afterwards returned to the mouth of the Tweed with only 500 men, with which

which she took Berwick. The king of Scotland permitted her to raise some troops in his dominions; and Henry now employed himself in forming an army, and advanced towards Hexham, where the marquis of Montagu, one of Edward's generals, attacked him in his lines, killed the best part of his men, and put the rest to flight. The unhappy Henry fled to Scotland, and Margaret, with her son, escaped on foot to the borders of a wood, where she was overtaken by night. In that wood, it is said, she was met by robbers, who took from her her jewels, which were all she had left; but while they were disputing about the booty, she escaped from them with her son, and entered the thickest part of the forest: and the prince being tired and unable to walk, she took him in her arms, and proceeded forward. Another robber, who was going to meet the above gang, to which he belonged, soon met her with his sword in his hand. Margaret, in this extremity, roused up her courage, and holding out the prince towards him, said, "Friend, save the king's son." At her mentioning the king, the sword dropped from his hand: he offered his service, and took the prince, whom she could no longer carry; then led her to a neighbouring village, where was his house and family. Margaret staid there some days, where she privately informed herself of the consequences of the battle of Hexham, and was joined by the seneschal of Normandy, the duke of Exeter, and Edmund the duke of Somerset's brother, who took her to Carlisle; where she found a bark, in which she went to Kirkbridge, and lodged with an Englishman named Cork, who knew and betrayed her; but she was saved by the valour of the Seneschal, and got to Edinburgh. There she learned that her husband having imprudently left Scotland, had fallen into the hands of his enemies, and was confined in the Tower of London: on which she a second time repaired to the court of France, where she found assistance which she did not expect. Edward had sent the earl of Warwick as his ambassador, to demand Lewis XIth's daughter in marriage; that king had given his consent, and Warwick had sent his master an account of his success; when he was informed, that in his absence Edward had married Elizabeth Widvill. The earl, enraged at this affront, resolved to be revenged, and coming to England, soon appeared at the head of an

army. Edward speedily marched against him; but the earl surprised him in his camp, and took him prisoner. He intrusted the care of Edward to his brother the bishop of York; but that prelate letting him escape, he returned to London with the acclamations of his friends. The earl of Warwick now retiring to France, Margaret met him at Dieppe, and there an interview extinguished their mutual resentments; and they united their interests by the marriage of the prince of Wales with Anne Nevill, the earl's daughter. From this moment he resolved to replace Henry on the throne. Lewis furnished him with 4000 men, and ships to convey them to England, and with these he landed at Dartmouth. Immediately those of his party flocked to him on all sides, and soon had an army of 60,000 men. Edward, alarmed at this news, now fled to Holland, and Margaret entered London amidst the acclamations of the people. The misfortunes she had suffered filled her mind with sensibility, and she treated Elizabeth, Edward's wife, with all the respect due to her as the wife of a king. Edward, returning again to England, had soon a great army; marched towards London, and was received there with joy. The earl of Warwick marched there to attack him, but was defeated, and lost his life at Barnet. The lords of Margaret's party revived her hopes, and formed a new army, which no sooner came to the ears of Edward, than he marched with all his troops, and defeated the queen's army, which was commanded by the duke of Somerset. That duke, with the queen and prince of Wales, were made prisoners, and the latter barbarously murdered in the king's tent. Margaret's grief was inexpressible. In the first transports of her rage, she uttered invectives against Edward that had like to have cost her her life: but Edward, after much deliberation, at length resolved to be satisfied with confining her in the Tower of London, where she remained five years. At length, by the solicitation of Lewis XI. she obtained her liberty: but on leaving her prison, she was obliged to renounce her dowry, her jewels, and every thing she had a right to claim as queen dowager of England. Rene, her father, to engage Lewis to solicit for her liberty, had yielded to France all his rights to Provence, Anjou, and the duchies of Lorraine and Bar: thus Margaret found herself stripped at

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the same instant, not only of all which an established right had granted her in England, but of all the advantages derived from her birth, she being the only heiress of the house of Anjou. She resided at Aix with her father, and, after his death, retired to the castle of Dampierre, in Anjou, which belonged to an old gentleman, named Vignole, who had spent his life in her father's service. She there contracted a close intimacy with the earl of Richmond, afterwards Henry VII. and was in the centre of all the intrigues formed against Edward in favour of that prince, but did not live to see him raised to the throne, she dying on the 25th of August, 1482.

MARJORAM, *Majorana*, in botany, &c. See *Majrana*.

MARITIME, relating to, or bounded by the sea: thus, a maritime province or country, is one bounded by the sea; and a maritime kingdom, or state, is one that makes a considerable figure, or is very powerful at sea.

MARK, in commerce, a certain note which a merchant puts upon his goods, or upon the hoghead, &c. that contains them, in order to distinguish them from others.

ST. MARK the Evangelist's Day, a festival of the Christian church, observed April 25.

ST. MARK's Gospel, a canonical book of the New Testament, being one of the four Gospels. St. Mark wrote his Gospel at Rome, where he accompanied St. Peter, in the year of Christ 44. Tertullian and others pretend, that St. Mark was only an amanuensis to St. Peter, who dictated this Gospel to him; others affirm, that he wrote it after St. Peter's death. Nor are the learned less divided as to the language this Gospel was wrote in; some affirming it was composed in Greek, others in Latin. Several of the ancient heretics received only the Gospel of St. Mark; others among the Catholics rejected the twelve last verses of this Gospel. The Gospel of St. Mark is properly an abridgment of that of St. Matthew. St. Mark is said to have written his Gospel in the year 43, after which he went to propagate the faith in Egypt, where he founded the church of Alexandria, of which he was the first bishop, and died in that city about the year 62.

Knight of St. MARK, an order of knighthood in the republic of Venice under the protection of St. Mark the

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Evangelist. The arms of the order are, gules, a lion winged, or; with this device, *PAX TIBI MARCE EVANGELISTA*. This order is never conferred but on those who have done signal service to the commonwealth.

MARK, or **MARC**, also denotes a weight used in several states of Europe, and for several commodities, especially gold and silver.

MARK is also used among us for a money of account, and in some other countries for a coin. The English mark is two thirds of a pound sterling, or thirteen shillings and fourpence; and the Scotch mark is of equal value in Scotch money of account. The mark-lubs, or Lubeck mark, used at Hamburg, is also a money of account equal to one third of the rix-dollar, or to the French livre; each mark is divided into sixteen sols-lubs. Mark-lubs is also a Danish coin equal to sixteen sols-lubs. Mark is also a copper and silver coin in Sweden. See *Exchange*.

MARKET, a public place in a city or town, in which live cattle, provisions, or other goods are exposed to sale.

MARLE, *Marga*, a kind of dry, soft, fossil earth, used for manuring land. The word is derived from the old Celtic *Marga*, mentioned by Pliny. The principal sorts of marle are the white and red. Too much of it thrown on the ground is found to burn it. Marle is burnt like other stone for making of lime. It is a very material circumstance in the marling of land to find out how much the land requires of this manure; and till experience has thoroughly shewn this, it is better to err in laying on too little than too much; because the latter is a fault not to be remedied. It is to be observed also, that marle never makes so great an improvement on land the first year, as it does afterwards. In Staffordshire they lay two hundred loads of marle upon an acre of land of the common kind; but where the soil is black, loose, and sandy, or full of worms, they will lay on three or four hundred loads to an acre; it being a rule with them, that this sort of soil cannot be marked too much. If the mould be thin, the less marle does; if deep, it must have the more. It is best sowing of marled lands under furrow; because if these lands are well husbanded, they will be very mellow and hollow, which will occasion the earth's sinking from the roots of the corn, if it stand too high. If marle fattens land, or makes

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makes it stiff or binding, it must be well drenched, and laid down for grass. In Staffordshire, after their land is marled, their way is to take the crops following. After the first crop of wheat is off, they plow in the wheat stubble in December, and if the weather proves frosty, to mellow it, they do not plow it again till April. They then sow it with barley, allowing three bushels of seed to an acre. The common produce of this is thirty bushels. After this they sow pease, for which they plow once in the February following, allowing only three bushels of seed to an acre, as in the barley. Next after this, if they intend six crops, they sow wheat again upon the pease crop; the fifth crop is, barley again; and the sixth year's is red oats. Some sow two or three crops more, when the ground has been well marled, but that is much better let alone. In digging for the marle they use in manuring the lands, in Ireland, they meet with fossil horns, and other curious fossils. The marle always lies in the bottom of low bogs. It is never met with in any other places, and is found by boring with augres made for that purpose. It usually lies at five, seven, or nine feet deep.

Dice MARLE, in husbandry, a name given by the people of Staffordshire to a reddish marle, that breaks into small square pieces like dice, or else into thin flakes, in the manner of lead ore, and looks smooth on the surface.

• MARLI, a beautiful palace of France, between Versailles and St. Germain, is seated on a valley, at the extremity of a forest of the same name. The gardens are extremely well laid out, and are in a charming situation. This palace was built by Lewis XIV. and is adorned on the outside with paintings in fresco. The most remarkable things on the inside are two globes of twelve feet in diameter, with all their furniture. The great cascade in the garden is properly a river, which falling from on high, forms several sheets of water; and below there are basons, adorned with groups of figures; not to mention the statues, fountains, and the variety of fine water-works. It is ten miles from Paris. Long. 2. 20. Lat. 48. 57. N.

MARMALADE, a confection of plums, apricots, quinces, &c. boiled with sugar to a proper consistence.

MAKMOTTE, in zoology, the largest animal of the mus or rat kind, with a long naked tail and tawney body; it is

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almost as large as a hare, and breeds only on the tops of mountains in Switzerland. Its feet resemble those of a bear.

MARONITES, in church-history, a sect of Christians near mount Libanus in Syria, who are in communion with the church of Rome, and have their patriarch, archbishops, bishops, &c.

MARQUE, or *Letters of MARQUE*, in military affairs, letters of reprisal, granting the subjects of one prince or state liberty to make reprisals on those of another. Letters of marque, among us, are extraordinary commissions granted by authority, for reparation to merchants, taken and despoiled by strangers at sea; and reprisals is only the retaking or taking of one thing for another.

MARQUETRY, or *INLAID-WORK*, a curious work composed of several fine pieces of wood, of various colours, fastened in thin slices on a ground, and sometimes enriched with other matters, as silver, brass, tortoise-shell, and ivory; with these assistances the art is now capable of imitating any thing; whence it is by some called the art of painting in wood.

MARQUIS, a title of honour, next to that of duke, first given to those who commanded the marches, that is, the borders and frontiers of countries. Marquises were not known in England till king Richard II. in the year 1337, created his great favourite, Robert Vere, earl of Oxford, marquis of Dublin; since which time there have been many creations of this sort, though at present there is but one English and two Scotch marquises. There is also a marchioness in her own right in England, viz. the marchioness de Grey. The manner of creating a marquis differs in nothing from that of a duke, except the difference of the titles, and the marquis's being conducted by a marquis and an earl, while a duke is led by a duke and a marquis; he is also girt with a sword, has a gold verge put into his hand, and his robe or mantle is the same as those of a duke, with only this difference, that a duke's mantle has four guards of ermine, and a marquis's only three and a half. The title given him, in the style of the heralds, is, Most noble and potent prince. His cap is the same as a duke's, and the difference between their coronets consists in the duke's being adorned with only flowers or leaves, while the marquis's has flowers and pyramids with pearls on them, intermixed, to shew that he is a degree between a duke and an earl.

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MARRIAGE, a contract both civil and religious, between a man and a woman, by which they engage to live together in mutual love and friendship, for the ends of procreation, &c.

MARRO *Medulla*, in anatomy, has various significations: the white substance of the brain, in contradistinction from the cortical part, is called the spinal marrow: but, properly, marrow denotes that soft oleaginous substance contained in the cavity of the bones. Every bone in the body, of any considerable thickness, has either a large cavity, or is full of little cells: in both the one and the other is marrow contained in proper vessels that open into one another. In the larger bones this fine oil, by the gentle heat of the body, enters some narrow passages, which lead to certain fine canals excavated in the substance of the bone; and from these other cross passages, not directly opposite to the former, carry the marrow still farther into more longitudinal canals placed nearer the surface of the bone. All this contrivance is, that the marrow may supply the fibres of the bones, and render them less apt to break. By latter observations, blood-vessels have been found in the bones, so that they are nourished in the same manner as the other parts of the body. Besides, we find that many bones grow, and yet have no marrow in them, as the horns of deer, lobster claws, &c. All marrows are mollifying, rarefying, give relief by friction under lassitudes, and incarnate ulcers.

MARRUBIUM, hoar-hound and bastard dittany, a genus of plants, reputed attenuant and resolvent, and accordingly prescribed in most asthmas, and in all diseases of the breast and lungs. Formerly there used to be kept a compound syrup of it in the shops, but it is now out of use.

MARS, in astronomy, one of the superior planets, moving round the sun in an orbit between those of the earth and Jupiter.

For the diameter of this planet, and its mean distance from the sun, see *Diameter* and *Distance*. The character of this planet is ♂ , the excentricity of its orbit is 141, supposing the distance of the earth from the sun 1000 equal parts; the inclination of its orbit to that of the earth is $1^{\circ} 51'$; the periodical time in which it performs its revolution round the sun, is 686 days, 23 hours, 27' 30"; its revolution round its own axis 24 hours, 40'; and its parallax, 30". See *Cba-*

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rafter. Excentricity, &c. In the achronical rising of this planet, that is, when it is in opposition to the sun, it is found twice as near the earth as the sun, which is a phenomenon that has greatly discredited the Ptolemaic hypothesis. This planet, as well as the rest, borrows its light from the sun, and has its increase and decrease of light like the moon; and it may be seen almost bisected when in its quadratures with the sun, or in its perigæon; but is never cornicated or falcated, as the inferior planets. Dr. Hook, in 1665, observed several spots in this planet, which having a motion, he concluded the planet to have a turbinated motion round its center. In 1666, M. Cassini observed several spots in the two hemispheres of Mars, which, by continuing his different observations very diligently, he found to move by little and little from east to west, and to return in the space of 24 hours 40' to their former situation. Whence both the motion and period or natural day of that planet were determined. See *Maculae*. Mars always appears with a ruddy troubled light, whence we conclude that it is encompassed with a thick cloudy atmosphere, which by distributing the rays of light in their passage and re-passage through it, occasion that appearance. Besides the ruddy colour of Mars, we have another argument of his being encompassed with an atmosphere, and it is this, that when any of the fixed stars are seen near his body, they appear extremely obscured and almost extinct: and if this be the case, a spectator in Mars would scarce ever see Mercury, unless perhaps in the sun at the time of conjunction, when Mercury passes over his disk, as he sometimes appears to us in the form of a spot. An eye in Mars will see Venus at about the same distance from the sun as Mercury appears to us, and the earth about the same distance from the sun that Venus appears to us; and when the earth is found in conjunction with and very near the sun, the eye in Mars will see the earth horned or falcated, and its attendant, the moon, of the same figure, and utmost distance from the earth not above fifteen minutes of a degree: and as this planet's distance from the sun is to the distance of the earth and sun as $1\frac{1}{2}$ to 1; therefore a spectator in Mars would see the sun's diameter less by one third than it appeared to us, and consequently the degree of light and heat which Mars receives from the sun, is less by one third than

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than that received by the earth; this proportion will, however, admit of a sensible variation, on account of the great eccentricity of this planet.

Though the period or year of this planet, as has been already observed, is nearly twice as long as ours, and his natural day, or the time in which the sun appears above his horizon, setting aside the consideration of twilight, is almost every where equal to his night; yet it appears that in one and the same place, on his surface, there will be but very little variety of seasons, or scarce any difference of summer and winter: and the reason is, that the axis of his diurnal rotation is nearly at right angles with the plane of his orbit. It will be found, notwithstanding, that places situated in different latitudes, that is, at different distances from his equator, will have very different degrees of heat, on account of the different inclination of the sun's rays to the horizon, as it is with us when the sun is in the equinoxes.

MARS, among chemists, denotes iron, as being supposed to be under the influence of that planet.

MARINE generally implies the whole navy of a kingdom or state, comprehending all the royal dock-yards, and the officers, artificers, seamen, soldiers, &c. employed therein, as well as the shipping employed by the merchants for military or commercial purposes, together with whatever relates to navigation, ship-building, sailors, and marines.

That the legislature of Great Britain has ever been attentive to this great and important object, will appear from the following account of the laws that have been enacted relating to the affairs of the British marine.

So early as 5 Rich. II. c. 3. it was enacted, that none of the king's subjects should bring in or carry out any merchandize, but in English ships, on pain of forfeiting all the merchandize otherwise conveyed, or the value thereof; but 6 Rich. II. ordains, that the above statute shall only take place where able ships belonging to the king's subjects are to be found; for where they are not to be had, the merchants are allowed to hire other ships. By 4 Hen. VII. c. 10. it was enacted, that no Gascoign or Guienne-wines, &c. should be imported into this realm but in English vessels: and that none should freight any merchandize in any stranger's ship, if he could have f.f.

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sufficient freight in a denizen's ship, under the penalty of forfeiting all merchandize not thus shipped, to be divided between the king and the seizer: but this act, so far as it related to the above wines, was repealed by the statute 31 Hen. VIII. c. 14. and a rate was ordered of what should be paid for the freight of the several sorts of merchandize in ships, from the port of London to other places, and from thence to London. By 1 Eliz. c. 13. it was enacted, that if the owner of any merchandize should, in the time of peace, embark or unload any part thereof, (masts, pitch, tar, and corn, only excepted) out of, or into any foreign ship, he should pay custom as an alien.

By the act of navigation, 12 Car. II. c. 18. it is enacted, that no goods shall be imported into, or exported out of, any territories belonging to his majesty, his heirs and successors, in Asia, Africa, or America, in any other ships besides such as belong to the people of England, Ireland, Wales, or the town of Berwick upon Tweed, and whereof the master and three fourths of the mariners are English, on pain of forfeiting both ship and lading, one third to the king, another to the governor of the country where such default shall be, if seized there, otherwise that third also to the king, and the other third to him that will seize or sue for the same. And commanders at sea, having the king's commission, are to bring in as prize all such ships, and on their being condemned, one moiety is to be for the use of such commanders and their companies, and the other moiety to the king. No goods of the growth or manufactures of Muscovy, or of the produce of the Turkish empire, shall be imported into England, Ireland, &c. in any ship or vessel not English built, or not belonging to the people of England, Ireland, &c. and navigated as aforesaid; except vessels built at the place from whence the goods came, or of such port where they can only be, and usually are shipped, on pain of forfeiting the ship and goods; and all wines of the growth of France and Germany, and diverse goods and merchandize from Spain, Portugal, Russia, &c. which shall be imported into the places aforesaid, in any other ship than what belongs to England, Ireland, &c. and are navigated as aforesaid, shall be deemed aliens goods, and pay accordingly. And no foreign-built vessel shall pass as a ship belonging to

England, Ireland, Wales, &c. till the owner makes it appear to the chief officer of the customs, in the port next to the place of his abode, that he is not an alien, and take an oath that it was *bona fide* bought of such persons, expressing the sum given, and the time and place when and where, &c. and that no foreigner has a share in it. Also none shall load in any bottom, if strangers are owners, part-owners, or master, and of which three-fourths of the marines at least are not English, any goods whatsoever from one port or creek of England, Ireland, Wales, Guernsey, Jersey, or the town of Berwick, to another port of the same, on pain of forfeiting such goods and vessel.

By the 22d and 23d Car. II. c. 11. it is enacted, that where any goods shall be laden on board any English ship of the burden of two hundred tons, or upwards, and mounted with sixteen guns, or more, if the master yields up such ship or goods to any Turkish vessel, or any pirate, without fighting, he shall be incapable of taking charge of any English vessel: and masters of English ships, though not of that burden, nor mounted as aforesaid, that shall yield without fighting to a Turkish ship or pirate, that has not at least double the number of guns, shall be liable to the penalties of this act. If any inferior officers or mariners of a ship, shall refuse to fight when commanded, or utter words to discourage others, they shall lose all their wages due, and be imprisoned not exceeding six months; and mariners laying violent hands on their commanders, to hinder them from fighting in defence of their ships, shall suffer death as felons. When any English ship shall have been defended by fight, and brought to her port, in which fighting any of her men have been wounded or slain, the judge of the admiralty, or his surrogate, &c. where she shall arrive, upon the petition of the master and seamen, may call so many as he shall be informed are the adventurers and owners, and by advising with them, levy upon the respective owners such sums as he himself, and the major part of them present, shall judge reasonable, not exceeding two per cent. of the ship and goods; which money shall be distributed among the master, officers, and seamen, or the widows and children of the slain, according to the direction of the judge, with the approbation of three or more of the adventurers. By the 5th and 6th of Will. and Mary, c. 24. every

person who shall build, or cause to be built any ship of three decks, containing 450 tons, and mounted with thirty-two pieces of ordnance, having ammunition, &c. proportionable, shall for the first three voyages which the said ship shall make to any foreign parts, receive a tenth of the customs called the subsidy of tonnage and poundage, payable for merchandize exported and imported in such ships; but if after the end of the three first voyages, ships so built, shall be altered so as to become less defensible than they were at first, then they shall be forfeited and lost.

By 2 Ann. c. 9. owners of ships might navigate during the war with France, with masters, and only one half of the mariners English: and by 3 and 4 Ann. c. 13. any ships might be navigated by foreign seamen; and foreigners serving on board any English ship for two years, were to be deemed natural-born subjects, &c.

By 4 Geo. I. c. 12. and 11. Geo. 1. c. 29. if any officer or mariner belonging to any ship or vessel, shall willfully cast away, burn, or destroy the ship to which he belongeth, or in any-wise direct to procure the same to be done, with intent to prejudice a person that shall have granted any insurance thereon, &c. he shall on conviction be adjudged guilty of felony without benefit of clergy.

By 6 Geo. II. c. 29. masters of ships lying in the river Thames, who have occasion for ballast, shall pay 1 s. per ton, colliers, other ships 1 s. 3 d. and foreign ships 1 s. 7 d. per ton, to the corporation of the Trinity-house at Deptford; who shall pay ballast-men 9 d. a ton, for raising and carrying it, &c. and it shall be lawful for any master of a ship to appoint two persons to go on board any lighter bringing ballast to such ship, to inspect the marks thereof; and every ballast-man shall immediately before the delivery of ballast to any ship, trim such lighter, so as to make it swim at equal marks at the stem and stern, and pump all the water out, &c. and the master, wardens, and assistants of the Trinity-house, are to make good to the master, the quantity or value of the ballast which shall be found deficient, or forfeit 50 l. one moiety to the poor, and the other to the person suing for it. The 7th of Geo. II. c. 15. ordains, that no owners of ships shall be liable to any loss by reason of embezzlement by the master or mariners, of any goods or merchandize shipped

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shipped on board, or for any act done by them, without the privity or knowledge of such owners, further than the value of the ship, and amount of the freight during the voyage, in which such embezzlement of the master or mariners shall be committed; and if several persons shall suffer damage by the means aforesaid, and the value of the ship and cargo should be sufficient to make compensation; then the freighters shall receive satisfaction in average, in proportion to their respective losses, to be ascertained on a bill in equity, exhibited for a discovery thereof, and of the value of such ship and freight. But nothing in this act shall discharge any remedy, which any person may have against the master and mariners, in respect of an embezzlement. See *Freight, Insurance, &c.*

MARINES, or MARINE FORCES, a body of soldiers raised for the sea-service, and trained to fight either in a naval engagement, or in an action ashore. The great service of this useful corps was manifested frequently in the course of the late war, particularly at the siege of Belleisle, where they acquired a great character, although lately raised, and hardly exercised in military discipline. At sea they are incorporated with the ship's crew, of which they make a part, and many of them learn in a short time to be excellent seamen, to which their officers are ordered by the admiralty to encourage them, although no sea-officer is to order them to go aloft against their inclinations. In a sea-fight their small arms are of great advantage in scouring the decks of the enemy; and when they have been long enough at sea to stand firm when the ship rocks, they must be infinitely preferable to seamen if the enemy attempts to board, by raising a battalion with their fixed bayonets to oppose him. See *Boarding.*

* **MARR,** a county of Scotland, bounded on the north by Buchan and Banff; on the east by the German Ocean; on the south by Mers and Gowry; and on the west by Badenoch and Athol. The chief town is Aberdeen.

* **MARS,** in pagan worship, the God of war. According to some, he was the son of Jupiter and Juno, others say he was the son of Juno alone, who being angry at Jupiter's having produced Minerva from his brain, in revenge conceived by touching a flower, and became the mother of this formidable deity. The amours of Mars and Venus, and the manner in which Vulcan detected them, and

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exposed them to the laughter of the other Gods, have been described by many of the ancient poets. He is said to have had many wives and mistresses, and a considerable number of children. Mars was held in great veneration by the Romans, from his being the father of Romulus, their founder, and also from their inclination to conquest. He had magnificent temples erected to him at Rome. Mars is represented in a chariot, drawn by furious horses. He is completely armed, and extends his spear with one hand, and grasps a sword, imbrued in blood, with the other. He has a fierce and savage aspect, Discord is represented preceding his car, and Clamour, Fear, and Terror, appear in his train. The victims sacrificed to him were the wolf, the horse, the wood-pecker, the vulture, and the cock. This god is evidently of Egyptian original, for in the sacrifices which immediately preceded their military expeditions, their Isis, who appeared in a warlike dress, and gave rise to the Greek Pallas, or Minerva, was accompanied by another figure, equipped like Mars, with an helmet and buckler.

MARSHAL, in its primary signification, an officer who has the command or care of horses; but it is now applied to officers who have very different employments; as earl-marshal, knight-marshal, or marshal of the king's horse, &c.

MARSHAL, or MARESCHAL, of France, an officer of the greatest dignity in the French armies.

MARSHALLING a coat in heraldry, the disposal of several coats of arms belonging to distinct families, in the same escutcheon or shield, together with their ornaments, parts, and appurtenances.

MARSHMALLOW, *Althæa*, in botany and medicine. See *Althæa*.

MARSHY LANDS, those liable to be overflowed by the sea, &c. for the draining of which, see the articles *Ditch, Drain, &c.*

MARTIAL LAW, the law of war, which entirely depends on the arbitrary power of the prince, or of those to whom he has delegated it; for though the king can make no laws in time of peace without the consent of parliament, yet in time of war he uses an absolute power over the army.

MARTIN, *Martes*, in zoology, a species of mustela, of a blackish brown colour, and with a pale throat: it is about the size of a common cat, but more slender.

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MARTIN is also the name of a bird of the hirundo kind, of a black colour, and with the throat white.

MARTINGALE, in the menage, a thong of leather fastened to one end of the girths under the belly of a horse, and at the other end to the mufs-roll, to keep him from rearing.

MARTLETS, in heraldry, are little birds represented without feet, and used as a difference or mark of distinction for younger brothers, to put them in mind that they are to trust to the wings of virtue and merit, in order to raise themselves, and not to their feet, they having little land to set their feet on.

MARTYR, one who lays down his life for the gospel, or suffers death for the sake of his religion. The festivals of the martyrs are of very antient date in the Christian church, and may be carried back at least to the time of Polycarp, who suffered martyrdom about the year of Christ 168. On these days the Christians met at the graves of the martyrs, and offered prayers and thanksgivings to God for the examples they had afforded them; they celebrated the eucharist, and gave alms to the poor; which, together with a panegyric oration or sermon, and reading the acts of the martyrs, were the spiritual exercises of these anniversaries.

MARTYROLOGY, in the church of Rome, a catalogue or list of martyrs, including the history of their lives and sufferings for the sake of religion.

MARUM SYRIACUM, Syrian herb-mastich, in botany, a low shrubby plant, which is said to be a native of Syria, and of one of the Hieres islands, on the coast of Providence: in our climate it does not well bear severe winters without shelter. The leaves of marum have a bitterish, aromatic, very pungent taste: and when rubbed a little, yield a quick, piercing smell, which provokes sneezing. They have been chiefly made use of as an ingredient in sternutatory powders, though, from their sensible qualities, they promise to be applicable to more important purposes, and to have no ill title to the stimulating, attenuating, deobstruent, antiseptic virtues ascribed to them by Wedelius in a dissertation on this plant: they seem particularly well adapted as an ingredient in the volatile oily aromatic spirits, with which their agreeable pungency in a great degree coincides. The marum loses but little of its pungency on being dried, and in this respect it differs

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remarkably from many other acrid herbs, as those called antiscorbutic.

* **MARSEILLES**, a large city and sea-port town of Provence. It is one of the most considerable in France, being populous and carrying on a great trade. Its harbour is of an oval form, and has a quay fourteen hundred paces long, on which are the finest houses of the city, and it yields a most agreeable walk. In the day time one part of it is taken up by the shops of the galley-slaves, in which are all sorts of toys and drugs. The mouth of the harbour is barred with a chain, which is supported by three stone piers. The cathedral church of Notre Dame was formerly a heathen temple. In the collegiate church of St. Martin is the image of the Virgin Mary in silver, five feet and a half high, and the crown and ornaments immensely rich. The church of St. Saviour, now a nunnery, was consecrated to Apollo. There are here several religious houses of both sexes. There is likewise a dock for building ships, and an arsenal, which terminates the walls of the city. The town-house is seated on the harbour, and under it is a room where the merchants meet, that above being reserved for the governors and magistrates. Marseilles is fortified by strong walls, and the tetragon is the principal of the two citadels which command it. This city is surrounded with large fields, in which are six thousand summer-houses of the citizens, with gardens and vineyards. At this place may be had coral, silks, and the best drugs, from all parts of the world. In 1720, a ship from Sayd brought the plague, which made a terrible havock among the inhabitants. Marseilles is seated near the Mediterranean Sea, fourteen miles south of Aix, and four hundred and twenty-two south by east of Paris. Long. 5. 27. E: Lat. 43. 18. N.

* **MARTINICO**, a large island of North-America, and one of the Caribbees. It is about forty miles in length, and one hundred in circumference. The French possessed it from 1635 till the 13th of February, 1762, when it was taken by the English; but was restored to the French by the peace of 1763. There are many high mountains covered with trees, as well as several rivers and fertile valleys, but they will not bear either wheat or vines. It produces sugar, cotton, ginger, indigo, chocolate, aloes, pimento, plantains, and other tropical fruits. It is extremely populous, and the governor-

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governor-general of the French Caribbee Islands resides here. It has several safe and commodious harbours, which are all well fortified. The principal places are Fort Royal, Fort St. Peter, Fort Trinity, Fort Marigot, and Fort Dumouillage. There are still some of the ancient inhabitants remaining. Long 62. 30. W. Lat. from 14. 0. to 15. 0.

* **MARY STUART**, queen of France and Scotland, was the daughter of James V. of Scotland, and Mary de Guise, the daughter of Claude I. of Lorraine, duke of Guise. She succeeded her father when eight years of age, and was carried into France during the civil wars which broke out in Scotland, where she was educated at the court of Henry II. and on the 24th of April, 1558, married the dauphin, on which they both assumed the title of king and queen of Scotland, England, and Ireland, and quartered their arms accordingly. Queen Elizabeth caused her ambassador in France to complain of this usurpation, but without effect: and therefore considered Mary as a dangerous rival. The dauphin was crowned king of France on the death of his father, by the name of Francis II. but died soon after; on which Mary quitted the title of queen of England, and returned into Scotland, where she married her cousin Henry Stuart, lord Darnley, and caused him to be styled king of Scotland. She at first shewed great fondness for him, but afterwards rendered him jealous by her familiarity with her favourite Rizzio, an Italian sidler. On which the earl of Morton, and some others, wounded Rizzio in the queen's presence, when she was advanced about five months in her pregnancy, and then drawing Rizzio into another room, they completed the murder. The earl of Bothwell soon after became her favourite, and while he appeared with a royal magnificence, and was loaded with favours, she treated her husband with indifference, and the greatest indignities. The king was soon after murdered, as it is said, by the earl of Bothwell, who a few months after married the queen, having first divorced his wife, and afterwards treated the queen with great brutality. The disturbances in Scotland now obliged queen Mary to seek for protection in England, while her young son James was crowned king of Scotland. Mary, however, was imprisoned by order of Elizabeth, and after being confined eighteen years, was beheaded for a conspiracy, on the 18th of February, 1567, in the forty-

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third year of her age. Queen Elizabeth has been greatly blamed for this act of severity. This unhappy princess was extremely beautiful and accomplished.

* **MARY**, queen of England, daughter of king Henry VIII. and Catharine of Arragon, was born the 18th of February, 1515. On her father's marrying Anne Boleyn, she was declared illegitimate. After the death of Edward VI. in 1553, lady Jane Grey was proclaimed queen of England, but Mary promising that no change should be made in religion, obtained the crown, and some time after, lady Jane, with the lord Dudley, and other persons of quality, were beheaded. Soon after Mary's accession to the throne, she married Philip II. afterwards king of Spain, son of the emperor Charles V. who was then living, and in violation of the most sacred promises, began a dreadful persecution of the Protestants, which was carried on by Bonner, bishop of London, and Gardiner, bishop of Winchester. Great numbers of persons suffered martyrdom at the stake; among which were Cranmer, Ridley, Latimer, Hooper, and Ferrer; and all the prisons in the kingdom were crowded with those pious sufferers, who submitted to persecution rather than violate their consciences. Even the princess Elizabeth was closely watched, and obliged to conceal her religious sentiments. Amidst these dreadful proceedings, Mary was far from being happy; a continual disagreement with her husband, who was younger than she, and of whom she was passionately fond, with the loss of Calais, which was taken by the French, threw her into a complication of distempers, of which she died without issue, the 17th of November, 1558, in the forty-fourth year of her age, after a bloody reign of five years, four months, and eleven days, and was succeeded by Elizabeth.

* **MARY II.** queen of England, was the eldest daughter of James II. king of England, by his first wife the lady Anne Hyde, and was born at St. James's the 10th of May, 1662. On the 15th of November, 1677, she married William Henry of Nassau; went into Holland with her husband, who was made stadtholder of the United Provinces, and staid there till 1689, when, after the abdication of king James, she returned to England, and on the 11th of April was crowned queen, and her husband king of England, by the name of William III. She endeared herself to the people by the wisdom

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wisdom of her conduct, and during the absence of king William, had the administration of affairs, which she managed with great glory. She protected the arts and sciences, and died of the small-pox at Kensington palace, the 28th of December, 1694.

MARYGOLD, or **MARSH-MARYGOLD**, a plant called by the botanists caltha.

French **MARYGOLD**, in botany, tagetes.

* **MARYLAND**, an English settlement in North-America, at the north end of Chesapeake-bay, which divides it into two parts, called the eastern and western shores. It is bounded on the north by Pennsylvania; on the east by another part of Pennsylvania and the sea; on the south by Virginia; and on the west by the Allegany mountains. It is one hundred and forty miles in length, and nearly the same in breadth. At first, when it was settled, it was almost covered with trees, except in some few spots, which were old plantations of the original inhabitants. It resembles Virginia in all things, and the planters live in houses dispersed about the country, and generally near the rivers, for the convenience of putting their hogheads of tobacco readily on board the ships. The governor and proprietor of this country was the late lord Baltimore, and the council was appointed by him; but the house of representatives is chosen by the freeholders.

MASCULINE, or **MASCULINE-GENDER**, among grammarians, that belonging to the male. See *Gender*.

MASON, a person employed under the direction of an architect, in the raising of a stone building.

MASONRY, in general, a branch of architecture, consisting in the art of hewing or squaring stones, and cutting them level or perpendicular, for the uses of building; but in a more limited sense, masonry is the art of assembling and joining stones together with mortar.

All the kinds of masonry now in use may be reduced to these five; viz. bound masonry; that of brick-work, where the bodies and projectures of the stones inclose square spaces, or pannels, &c. set with bricks; that de moilon, or small work, where the courses are equal, well squared, and their edges or beds rusticated; that where the courses are unequal; and that filled up in the middle with little stones and mortar.

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MASQUE, or **MASK**, a cover for the face, with suitable apertures for the eyes and mouth.

MASQUES, in architecture, certain grotesque faces, used to fill vacant places, as friezes, pannels of doors, keys of arches, &c.

MASQUERADE, an assembly of persons masked, and dressed in peculiar habits, meeting to dance and divert themselves, and oftentimes for worse purposes. Masquerades are now in disrepute, on account of their not being countenanced by his present majesty.

MASS, *Missæ*, in the church of Rome, the office or prayers used in the celebration of the eucharist; or, in other words, consecrating the bread and wine into the body and blood of Christ, and offering them so transubstantiated, as an expiatory sacrifice for the quick and the dead. As the mass is in general believed to be a representation of the passion of our blessed Saviour, so every action of the priest, and every particular part of the service, is supposed to allude to the particular circumstances of his passion and death.

* **MASINGER** (**PHILIP**) an old English dramatic poet, was born at Salisbury about the year 1585, and was educated at Oxford. On his leaving the university, he went to London, where he wrote many plays, which were greatly admired for the œconomy of the plots, and the purity of the style. He was as remarkable for his modesty as his abilities, and died suddenly at his house on the Bankside in Southwark, near the play-house, and was interred in St. Saviour's churchyard, in the same grave with Mr. Fletcher the poet.

MASSIVE, among builders, an epithet given to whatever is too heavy and solid: thus a massive column is one too short and thick for the order whose capital it bears; and a massive wall is one whose openings or lights are too small in proportion.

MAST, in ship building, a large strong post, or pole of timber, standing erect in a ship to carry sail, whereby she is enabled to make her progress through the sea. Among the ancient Grecians every ship had several masts: we are nevertheless informed by Aristotle, that at first there was only one mast, which was fixed in the middle of the ship. With regard to the moderns, the masts of their ships generally consist of three pieces, joined together lengthwise, viz. the lower-mast, the top-mast, and the top-gallant-mast.

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The top-mast stands at the head of the lower-mast, and the top-gallant-mast at the head of the top-mast, in the same manner, and either of the two latter can be occasionally taken down; but the lower-mast, as it is settled on the keel of the ship, can only be removed by hoisting it out, or cutting it away.

As every mast is composed of three pieces, so all ships, properly so called, are furnished with three masts, viz. the main-mast, the fore-mast, and mizen-mast. Those which have only two or one mast, are not called ships by sea-men, but vary their names according to their method of rigging. Of two masts there are snows, brigs, bilanders, ketches, buffes, schooners, and hermaphrodites, among the English. Among the Spaniards and Italians, fettees, barco-longas, seluccas, &c. Those of one mast are sloops, tartans, bean-cods, shallops, &c.

In the British navy, masts are proportioned to the extreme breadth of the ship from out to out.

The proportion for masting ships in the merchants service is generally regulated by the judgment and experience of the commander.

MASTER, *Magister*, a title of authority, as the grand master of Malta, the master of St. Lazarus, &c.

MASTER of a ship of war, an officer, who has the charge of navigating her from port to port, under the direction of the captain: the management and disposition of the sails, the conducting the ship in all extremities of danger, and directing her motions in the time of action, more particularly belongs to him, as also to superintend the provisions, and see that none are permitted to come aboard but such as are wholesome and sweet: he is also to take care that they are safely stowed by his mates and quarter-masters: these are also employed to superintend the navigation when he is off the deck, and to assist wherever his duty is concerned.

MASTER of a merchant ship, the officer who commands and directs the ship's course, manages her lading, and all other affairs.

MASTER at arms, in the marine, an officer whose business it is to confine and plant centries over the prisoners in a ship of war; to observe that all the lights and fires are put out when the evening gun fires, except such as are allowed by proper authority, or which are under the inspection of centries: he is also to attend

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the side when any boats come aboard, and search carefully that no spirituous liquors are brought into the ship, but what are permitted by the commanding officer. He is likewise to teach the seamen the exercise of the small-arms; for this purpose, in large ships, the master at arms has several corporals under him to assist in his office, and relieve the centries and each other.

MASTER attendant, in the king's dock-yards, an officer whose duty it is to observe that all the ships, which are laid up, or said to be in ordinary, are properly moored, cleaned, and kept in order; he also attends the musters in the dock-yard, to observe that all the men registered on the books do their duty: he has likewise the charge of the moorings, which are fixed in the river or harbour where he resides, which he is always to keep in good repair, that they may be ready to moor the ships of war when necessary, which employment he must also see securely performed: he removes the ships from one place to another in the harbour, and pilots them into and out of the docks, &c.

MASTER of arts is the first degree taken up in foreign universities, and for the most part in those of Scotland; but the second in Oxford and Cambridge; candidates not being admitted to it till they have studied seven years in the university.

MASTERS in chancery, of which there are twelve, the master of the rolls being chief, are usually chosen out of the barristers of the common law, and sit in chancery, or at the rolls, as assistants to the lord chancellor and master of the rolls. The lord chancellor also appoints several masters extraordinary in chancery, in different parts of the country, for the convenience of administering affidavits, &c. in causes depending in that court.

MASTER of the horse, a great officer of the crown, who orders all matters relating to the king's stable, races, breed of horses; and commands the equerries and all the other officers and tradesmen employed in the king's stables. His coaches, horses, and attendants, are the king's, and bear the king's arms and livery.

MASTER of the ordnance, a great officer who has the chief command of the king's ordnance and artillery.

MASTER of the revels, an officer who orders all things relating to the performance of plays, masks, balls, &c. at court.

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MASTER

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MASTER of the rolls, a patent officer for life, who has the custody of the rolls of parliament and patents which pass the great seal and of the records of chancery, as also commissions, deeds, recognizances; which, being made of rolls of parchment, gave rise to the name. He also hears and determines suits in the court of chancery, as well as the lord chancellor; and his decrees, like those of the lord chancellor, cannot be appealed from but to the house of lords.

MASTERWORT, in botany. See the article *IMPERATORIA*.

MASTICH, in the materia medica, a concrete resin, obtained in the island Chio from the Lentisk tree, brought over in small yellowish transparent grains or tears. From transverse incisions made in the bark of the tree, about the beginning of August, the resin exudes in drops, which running down, and concreting on the ground, are thence swept up: The tree is raised also in several parts of Europe; but no resin has been observed to issue from it in these climates; nor do all the trees of this species in the island Chio itself, afford this commodity. See the article *LENTISCUS*.

This resin has a light agreeable smell, especially when rubbed or heated: in chewing, it first crumbles, soon after sticks together, and becomes soft and white, like wax, without impressing any considerable taste.

Mastich is recommended, in doses of from half a scruple to half a dram, as a mild corroborant and astringent, in old coughs, hemoptyses, diarrhoeas, weakness of the stomach, &c. It is given either in substance, divided by other materials; or dissolved in spirit, and mixed with syrups; or dissolved in water into an emulsion by the intervention of gum-arabic or almonds: the decoctions of it in water, which some have directed, have little or nothing of the virtue of the mastich. It is said that this resin is commonly employed as a masticatory in Chio, and among the Turkish women, for sweetening the breath, and strengthening the gums and teeth; and that when thus used, by procuring a copious excretion of saliva, it proves serviceable in catarrhus disorders.

MASTICATION, *Masticatio*, in medicine, the action of chewing, or of agitating the solid part of our food between the teeth, by means of the motion of the jaws, the tongue, and the lip, whereby it is broken into small pieces, impreg-

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nated with saliva, and so fitted for deglutition, and a more easy digestion.

MASTICATORIES, in medicine, such remedies as are taken in at the mouth; and chewed in order to promote the evacuation of the salival humour, as tobacco, ginger, pepper, sage, rosemary, thyme, mastich, &c.

MAT, among sailors, a sort of web or texture, formed of a variety of foxes, each of which consists of a certain number of rope-yarns twisted together.

MATCH, a kind of rope slightly twisted, and prepared to retain fire for the uses of the artillery, mines, fireworks, &c.

MATCHING, in the wine-trade, the preparing vessels to preserve wines and other liquors, without their growing sour or vapid. The method of doing it, as directed by Dr. Shaw, is as follows: melt brimstone in an iron ladle, and when thoroughly melted, dip into it slips of coarse linnen-cloth; take these out, and let them cool: this the wine-coopers call a match; take one of these matches, set one end of it on fire, and put it into the bung-hole of a cask; stop it loosely, and thus suffer the match to burn nearly out: then drive in the bung tight, and set the cask aside for an hour or two. At the end of this time examine the cask, and you will find that the sulphur has communicated a violent pungent and suffocating scent to the cask, with a considerable degree of acidity, which is the gas and acid spirit of the sulphur. The cask may after this be filled with a small wine, which has scarce done its fermentation, and bunging it down tight, it will be kept good and will soon clarify: this is a common and very useful method, for many poor wines could scarce be kept potable even a few months without it.

MATE of a *Ship of War*, an officer under the master, whose duty it is to observe the navigation of the ship, and to keep the log strictly marked; to trim the sails in the fore-part of the ship, and to superintend all affairs relating to the cables, moorings, and riding of the ship; to command the boats in which provisions and water are brought to the ship, and assist in stowing them after they arrive abroad.

MATE of a *Merchant-ship*, the officer who commands the ship in absence of the commander, and shares the duty with him. The number of mates both in ships of war and merchant-men, is in proportion

tion to the size of a ship : a first rate man of war has six mates, and an East-India man the same number.

MATERIA MEDICA comprehends all the substances either used in medicine in their natural state, or which afford preparations that are so; these belong partly to the animal, partly to the vegetable, and partly to the fossil kingdom.

MATHEMATICS, that science which considers magnitudes either as they are computable or measurable : that part which relates to number only, is called arithmetic; and that which relates to measure in general, whether length, breadth, depth, motion, force, &c. is called geometry. The word is Greek, *μαθηματικη*, signifying the same thing, which is derived from *μαθητης*, a disciple, and that from *μαθαινα*, to teach. The first who cultivated mathematics after the flood were the Assyrians and Chaldeans, from whom, says Josephus, they were carried by Abraham to the Egyptians, and among these Aristotle fixes the first rise of mathematics. From Egypt, 584 years before Christ, they passed into Greece through the hands of Thales; after him came Pythagoras, who paid a particular regard to arithmetic, fetching the greatest part of his philosophy from numbers; he first, according to Lactantius, abstracted geometry from matter; and to him we owe the doctrine of incommensurable magnitude, the five regular bodies, besides the principles of music and astronomy. To him succeeded Anaxagoras, Oenopides, Brius, Antipho, and Hippocrates of Scio, who all applied to the quadrature of the circle, duplicature of the cube, &c. but the last with most success, and Proclus mentions him as the first compiler of the mathematical elements. Democritus excelled in mathematics as well as physics. The next is Plato, who not only improved geometry, but introduced it into physics. Out of his school proceeded a croud of mathematicians, among whom was Leodamus, who improved the analysis first invented by Plato; Theætetus, who wrote on elements, and Archytas, who first applied mathematics to use in life. These were succeeded by Neocles and Theon. Eudoxus excelled in arithmetic and geometry, and was the first founder of a system of astronomy. Menechonus improved the elements. Aristotle's works are stored with mathematics; out of whose school came Eudemus and Theophrastus; the first wrote of numbers,

geometry, and invisible lines; the latter a mathematical history. To Aristotle, Isidorus, and Hypsicles, we owe the books of solids, which, with the other books of elements, were improved and methodised by Euclid, who died 284 years before Christ. An hundred years after Euclid, came Eratosthenes and Archimedes; contemporary with the latter was Conon. Soon after came Apollonius Pergæus, whose conics are still extant. Hipparchus and Menelaus wrote on the subtenses in a circle, the latter on spherical triangles. Theodosius's three books of spherics are still extant. In the year 70, Ptolemy of Alexandria was born; he was succeeded by Plutarch the philosopher; after him came Eutocius, who commented on Archimedes, and occasionally mentions several inventions on the duplicature of the cube. To Ctesibes of Alexandria we owe our pumps, and Geminus came soon after, whom Proclus prefers to Euclid himself. Diophantus of Alexandria was a great master of numbers, and first inventor of algebra. Nichomachus is celebrated for his arithmetical, geometrical, and musical works; Serenus for his books on the section of the cylinder; Proclus, for his comments on Euclid; and Theon is, by some, thought to be the author of Euclid's Elements. Pappus of Alexandria flourished in the year 400, and his books of Mathematical Collections are still extant. The writers on the Mathematics have been very numerous since that time, and the improvements therein very great.

MATRICULA, a register kept of the admission of officers and persons entered into any body or society, of which a list is made.

MATRIX, *Uterus*, the womb, in anatomy, that part of the female of any kind where the fetus is conceived and nourished til the time of its delivery.

MATRIX, a place proper for the generation of vegetables, minerals, and metals.

MATRIX, in letter foundry. See *Foundry*.

MATRONALIA, a festival of the ancient Roman matrons, from whom it had its name. It was celebrated on the kalends of March in honour of the god Mars; and was to the Roman ladies what the festival of the Saturnalia was to their husbands; for at this time they served their women slaves at table, and received presents from their husbands.

MATROSSES, soldiers in the train of artillery,

artillery, who are next to the gunners, and assist them in loading, firing, and spunging the great guns. They carry fire-locks, and march with the store-waggons, both as a guard, and to give their assistance in case a waggon should break down.

MATTER, *Materia*, in physiology, whatever is extended and capable of making resistance: hence, because all bodies, whether solid or fluid, are extended, and do resist, we conclude that they are material, or made up of matter. The Cartesians, it is true, make matter to consist in extension alone; but extension, without resistance, is nothing but mere space. That matter is one and the same thing in all bodies, and that all the variety we observe arises from the various forms and shapes it puts on, seems very probable, and may be concluded from a general observation of the procedure of nature in the general formation and destruction of bodies. Thus, for instance, water, rarefied by heat, becomes vapour; great collections of vapours form clouds; these condensed descend in the form of hail or rain; part of this collected on the earth constitutes rivers; another part mixing with the earth enters into the roots of plants, and supplies matter to, and expands itself into various species of vegetables. In each vegetable it appears in one shape in the root, another in the stalk, another in the flowers, another in the seeds, &c. From hence various bodies proceed; from the oak, houses, ships, &c. from hemp and flax we have thread; from thence our various kinds of linen; from thence garments; these degenerate into rags, which receive from the mill the various forms of paper; hence our books; which by fire are converted partly into water, partly into oil, another part into air, a fourth part into salt, and a fifth into earth; which are called the elements of bodies, and which, mixed with common earth, are again resuscitated in various forms of bodies.

MATTHEW, or *Gospel of St. MATTHEW*, a canonical book of the New Testament. St. Matthew wrote his Gospel in Judea, at the request of those whom he had converted, and it is thought he began it in the year 41, eight years after Christ's resurrection. It was written, according to the testimony of all the ancients, in the Hebrew or Syriac language, which was then common in Judea; but the Greek version of it, which now passes for the original, is as

old as the apostolical times. St. Matthew's view in writing his Gospel, was chiefly to shew the royal descent of Jesus Christ, and to represent his life and conversation among men. No one of the Apostles enters so far into the particulars of the actions of Jesus Christ, or has given so many rules for the conduct of life. If we compare him with the other three evangelists, we may observe a remarkable difference in the order and succession of our Saviour's actions, from chap. iv. to chap. xiv. 13. Some have imputed this variation of St. Matthew to mere chance; and others to choice and design; however, it can be no prejudice to the truth of the facts, which are the essential part of the gospel; and as to the order of time, the sacred authors were not always solicitous about it.

* **MATTHEW** (ST.) an apostle and evangelist, was the son of Alphaeus, and was a Galilean as were the other apostles. He was a publican, that is, a receiver of the taxes, at Capernaum, and had his office near the sea of Galilee. Jesus passing that way, bid him follow him, on which he instantly obeyed. He for some time preached in Judea, and resolving to go into other countries, wrote the Gospel which bears his name about the year 36.

MATURATION, in surgery, the same with suppuration.

* **MATUTA**, in pagan worship, a goddess, said to have been the same with Ino, the wife of Athamas, king of Thebes, and the nurse of Bacchus; who was changed into a sea goddess, and called by the Greeks Leucothea. King Servius Tullius built a temple to her at Rome, and her feast was called *Matrales*.

MAUNCH, in heraldry, the figure of an ancient coat sleeve, borne in many gentlemen's escutcheons.

MAUNDAY-THURSDAY, the Thursday in Passion-week, which was called Maunday, or Mandate-Thursday, from the command which our Saviour gave his Apostles to commemorate him in the Lord's Supper, which he this day instituted; or from the new commandment which he gave them to love one another, after he had washed their feet as a token of his love to them. Our Saviour's humility in washing his disciples' feet, is commemorated on this day by most Christian kings, who wash the feet of a certain number of poor people, not indeed with their own royal hands, but by the hands of their lord almoner, or some other deputy.

MAUSO-

MAUSOLEUM, a magnificent tomb, or funeral monument. The word is derived from Mausolus, king of Caria, to whom Artemisia, his widow, erected a most stately monument, esteemed one of the wonders of the world, and called it, from his name, Mausoleum.

MAXILLA, the jaws, or those parts of an animal in which the teeth are set. The jaws are shorter in the human frame than in that of any other animal, in proportion to the size of the body; and this is a circumstance that adds greatly to the beauty of the face.

MAXIMUM, in mathematics. the greatest quantity attainable in any given case, and so stands opposed to minimum.

Methodus de MAXIMIS et MINIMIS, in mathematics, a method so called, whereby the greatest or least possible quantity attainable in any case is arrived at.

Thus (plate XXIX. fig. 5.) if the ordinate BC , flowing according to the direction AF , continually increases till it arrives at a certain place DE , after which it begins to diminish, the ordinate DE , in this case, is called the greatest ordinate, or a maximum.

On the contrary, if (fig. 6.) the ordinate BC , flowing according to the direction AF , continually decreases, till it come into the place DE , and after that it begins to increase, the ordinate DE , in this case, is called the least ordinate, or a minimum.

And how to determine the greatest or least state; that is, how to find the value of the correspondent abscissa AD , from the equation expressing the nature of the curve, is the proper business of the method *de maximis et minimis*.

And, to this end, we must observe that the fluxion of the ordinate BC is to the fluxion of the abscissa AB , as the ordinate BC is to the subtangent VB . Let us now suppose the ordinate BC (fig. 5.) in a flowing state moving according to the direction AF , it is manifest, that, the nearer the ordinate BC approaches the ordinate DE , the greater will be the subtangent BV , till when the ordinate BC arrives at, or is coincident with the ordinate DE , the tangent HEI to the point E , will be parallel to the axis AF ; consequently the subtangent BV will become infinite, in respect to the ordinate DE , and the fluxion of the ordinate itself will vanish, or become equal to nothing.

Whence to find the value of the correspondent abscissa, in this case let the

fluxionary value of the ordinate, deduced from the equation expressing the nature of the curve, be put equal to 0, or nothing; by which means all those members of the equation in which it is found will vanish, and those that remain will determine the place of the maximum.

MAY, *Maius*, the fifth month of the year, consisting of thirty-one days. See *Month* and *Year*.

MAYOR, the chief magistrate of a city or town chosen annually out of the aldermen.

MEAD, a liquor made of honey, held in great estimation by most of the northern nations, but perhaps not esteemed here so much as it might deserve, if due care was taken to prepare it properly.

MEADOW, in its general signification, pasture, or grass-land, annually mown for hay; but is more particularly applied to lands that are so low as to be too moist for cattle to graze upon them in winter, without spoiling the sward. Too much or too little water is almost equally prejudicial to meadows, but the best land for meadows is a rich soil, that has a moist bottom, especially where a small brook may be brought over it, and where there is such a descent, that the water will not lodge: these are better than those by great rivers, where the crops are often lost. Those that may be overflowed at pleasure, are called water meadows; these should never be overflowed till the end of March, except once or twice in winter, when there are such floods as bring down great quantities of soil from the upper lands, and if the season should prove dry, it will be of great service to the grass, if the meadows are overflowed again; but then the cattle should not be turned in till the sward is dry enough to bear their weight. Miller recommends the weeding of meadows in April and October, with a spaddle, and rolling them with a heavy roller in spring and autumn. See *Posture*.

MEAN, the middle between two extremes: thus we say, mean distance, mean proportion, &c.

MEASLES, in medicine, a cutaneous disease, attended with a fever, in which there is an appearance of eruptions that do not tend to suppuration. The measles begin with chilliness and shivering, and heat and cold succeed by turns. The next day the fever comes on, with great sickness, thirst, and loss of appetite; the tongue is white, but not dry; there is a little cough, a heaviness of the head and eyes,

eyes, and a continual sleepiness; then follows a sneezing, and swelling of the eye-lids, and a ferous humour often distils from the nose and eyes, which are certain signs that the eruption is at hand. In the face, the spots are small, but on the breast broad and red. The patient vomits, but oftener has a looseness with greenish stools. These symptoms continue and increase till the fourth, and sometimes the fifth day, at which time the spots, which are like flea-bites, increase in number and magnitude, but rise little above the skin. The symptoms do not immediately vanish after the eruption, as in the small-pox, except the vomiting. The cough and fever increase, with difficulty of breathing. About the sixth day, the skin of the face and forehead begins to grow rough, and the cuticle breaking, the pustules die away; and on the eighth day the spots disappear in the face, and are scarce visible any where else; on the ninth they quite vanish, and fine, thin, light scales fall from the skin. The measles are in general not dangerous, unless from an insalubrious epidemical constitution of the year, which sometimes renders them malignant: which may be known by a sudden loss of strength, coldness of the extreme parts, great restlessness, and a delirium. Those who die of the measles, are generally suffocated on the ninth day. Some have a looseness which continues several weeks, and brings on a mortal tabes. Some have a slow fever, with an atrophy, and a swelling of the abdomen, which are fatal; and when a cough and hoarseness remain after the disease, a consumption will follow without speedy assistance. If children are suspected to abound with crudities in the intestines, it will be proper to evacuate with half a grain of tartar emetic, and syrup of suc-cory with rhubarb. When there are worms, anthelmintics should be given. In adults abounding with blood, phlebotomy is necessary on the first days; and as soon as the eruption is ended, a gentle cathartic is proper: in a cough, nothing is better than oil of almonds fresh drawn, mixt with syrup of capillaire; half a spoonful of which should be often given in water-gruel. The patient should keep his bed for two days after the first eruption, and take absorbent and diaphoretic powders, to which half a grain of saffron may be added; these should be taken every night from the first onset of the disease, till the patient recovers, in-

creasing or diminishing the dose according to his age. If after the measles disappear, they should be followed by a difficulty of breathing, a fever, and other symptoms of an inflammation of the lungs, let blood be taken freely from the arm once, twice, or three times, as occasion shall require, leaving a due space between each bleeding, and give oil of sweet almonds, and about twelve days from the invasion let the patient be purged. The diet ought to be the same as in the small-pox, taking particular care that the body be kept lax rather than bound up, through the course of the distemper. See *Pox*.

MEASURE, *Mensura*, in geometry, any quantity assumed as one, or unity, to which the ratio of other homogeneous or similar quantities is expressed.

MEASURE of an Angle, an arch described from the vertex, in any place between its legs.

Hence angles are distinguished by the ratio of the arches, described from the vertex, between the legs to the peripheries. Angles then are distinguished by those arches; and the arches are distinguished by their ratio to the periphery: thus an angle is said to be so many degrees as there are in the said arch.

MEASURE of a Figure, or plane surface, is a square whose side is one inch, foot, yard, or some other determinate length. Among geometers, it is usually a rod called a square rod, divided into ten square feet, and the square feet into ten square digits.

MEASURE of a Line, any right line taken at pleasure, and considered as unity. The modern geometers use a decempeda, or perch divided into ten equal parts, called feet; the feet they subdivide into ten digits, and the digit into ten lines, &c.

MEASURE of the Mass, or Quantity of Matter, in mechanics, is its weight; it being apparent that all the matter which coheres and moves with a body, gravitates with it, and it being found by experiment that the gravities of homogeneous bodies are in proportion to their bulks; hence, while the mass continues the same, the weight will be the same, whatever figure it put on: by which is meant its absolute weight; for as to its specific, that varies as the quantity of the surface varies. See *Gravity* and *Moment*.

MEASURE of a Number, in arithmetic, such a number as divides another without

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without leaving any fraction: thus, 8 is a measure of 24.

MEASURE of a Solid, a cube whose side is one inch, foot, yard, or any other determinate length. In geometry, it is a cubic perch, divided into cubic feet, digits, &c. hence cubic measures, or measures of capacity. See *Sphere, Cube*, &c.

MEASURE of Velocity, in mechanics, the space passed over by a moving body in a given time. To measure a velocity, therefore, the space must be divided into as many equal parts as the time is conceived to be divided into; the quantity of space answering to such an article of time is the measure of the velocity. See *Velocity*.

MEASURE, in a legal and commercial sense, denotes a certain quantity or proportion of any thing bought, sold, valued, or the like. Measures are then various, according to the various kinds and dimensions of the things measured. Hence arise lineal or longitudinal measures, for lines or lengths; square measures, for areas or superficies; and solid or cubic measures, for bodies and their capacities. All which are different in different countries, and in different ages, and even many of them for different commodities. Whence arise other divisions of ancient and modern measures, domestic and foreign ones, dry measures, liquid measures, &c.

Long MEASURES, or MEASURES of Application. The English standard long measure for commerce, or that whereby the quantities of things are ordinarily estimated in the way of trade, is the yard, containing three English feet. Its divisions are the foot, span, palm, inch, and barley-corn; its multiples the pace, fathom, pole, furlong, and mile.

A Table of the MEASURES of Length of the principal Places in Europe, compared with the English Yard.

	Eng. yard.
100 Aunes or ells of England equal to	125
100 of Holland or Amsterdam	75
100 of Brabant or Antwerp	76
100 of France	128½
100 of Hamburg, Francfort, &c.	62½
100 of Breslau	60
100 of Dantzick	66½
100 of Bergen and Drontheim	68½

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100 of Sweden and Stockholm	65½
100 of St. Gall, for linens	87½
100 of ditto, cloths	67
100 of Geneva	124½
100 Canes of Marfeilles and Montpelier	214½
100 of Toulouse and High Languedoc	200
100 of Genoa, of 9 palms	245½
100 of Rome	227½
100 Varas of Spain	93½
100 of Portugal	123
100 Cavidos of Portugal	75
102 Brasses of Venice	73½
100 of Bergamo, &c.	71½
100 of Florence and Leghorn	64
100 of Milan	58½

N. B. The aunes or ells of Amsterdam, Haerlem, Leyden, the Hague, Rotterdam, and other cities of Holland, as also that of Nuremberg, being all equal, are comprehended under that of Amsterdam; as those of Osnabrug are under those of France; and those of Bern and Basil are equal to those of Hamburg, Francfort, and Leipzig.

Square, or Superficial MEASURES. English square or superficial measures are raised from the yard of 36 inches multiplied into itself, and thus producing 1296 square inches in the square yard: the divisions of this are square feet and inches; and the multiples, poles, roods, and acres; as in the following table.

English Square-MEASURES.

Inches	Feet	Yards	Paces	Poles	Rood
144	1296	9	27	10.89	40
3600	25	30½	43.6	166	4¼
30204	272½	1210	1743.6		
1568160	10890	4840			
6272640	43560				

Grecian

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Grecian square-measures were the plethron, or acre, by some said to contain 1444, by others 10000 square feet; and the aroura, the half of the plethron. The aroura of the Egyptians was the square of 100 cubits.

Cubical MEASURES, or Measures of Capacity for Liquids.—The English measures were originally raised from troy-weight; it being enacted by several statutes that eight pounds troy of wheat, gathered from the middle of the ear, and well dried, should weigh a gallon of wine-measure, the divisions and multiples whereof were to form the other measures; at the same time it was also ordered, that there should be but one liquid measure in the kingdom: yet custom has prevailed, and there having been introduced a new weight, viz. the avoirdupois, we have now a second standard gallon adjusted thereto, and therefore exceeding the former in the proportion of the avoirdupois weight to troy weight. From this

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latter standard are raised two several measures, the one for ale, the other for beer.

The sealed gallon at Guildhall, which is the standard for wines, spirits, oils, &c. is supposed to contain 231 cubic inches; and on this supposition the other measures raised therefrom, will contain as in the following table: yet by actual experiment, made in 1688, before the lord-mayer and the commissioners of excise, this gallon was found to contain only 224 cubic inches: it was however agreed to continue the common supposed contents of 231 cubic inches; so that all computations stand on their old footing. Hence as 12 is to 231, so is 14 $\frac{1}{2}$ to 281 $\frac{1}{2}$ the cubic inches in the ale-gallon: but in effect the ale-quart contains 70 $\frac{1}{2}$ cubic inches, on which principle the ale and beer-gallon will be 282 cubic inches. The several divisions and multiples of these measures, and their proportions, are exhibited in the following tables.

English MEASURES of Capacity for Liquids.

Wine-measure.

Solid inches			
28 $\frac{1}{2}$	Pint	8	Gallon
231		18	Rundlet
4158	144	31 $\frac{1}{2}$	Barrel
7276 $\frac{1}{2}$	252	42	Tierce
9702	336	63	Hogshead
14553	504	84	Punchoon
19279	672	126	Butt
29106	1008	152	Tun.
58212	2016	14	

Ale-Measure.

Pints			
8	Gallon	8	Firkin
64		16	Kilderkin
128		32	Barrel
256		48	Hogshead.

Beer-Measure.

Pints			
8	Gallon	9	Firkin
72		18	Kilderkin
144		36	Barrel
288		54	Hogshead.

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In the modern liquid-measures of foreign nations, it is necessary to observe, that their several vessels for wine, vinegar, &c. have also various denominations, according to their different sizes, and the places wherein they are used. The woeders of Germany, for holding Rhenish and Moselle wines, are different in their gauges; some containing 14 aumes of Amsterdam measure, and others more or less. The aume is reckoned at Amsterdam for 8 steekans or 20 verges, or for one-sixth of a ton of two pipes; or four barrels of France or Bourdeaux, which one-sixth at this latter place is called tiercon, because three of them make a pipe or two barrels, and six the said ton. The steekan is sixteen mingles, or thirty-two pints; and the verge is, in respect of the said Rhenish and Moselle and some other sorts of wine, of six mingles; but in measuring brandy, it consists of six one-sixth mingles. The aume is divided into four anckers, and the ancker into two steekans, or thirty-two mingles. The ancker is taken sometimes for four twenty-fourths of a ton, or four barrels, on which footing the Bourdeaux barrel ought to contain at Amsterdam (when the cask is made according to the just gauge) twelve and $\frac{1}{2}$ steekans, or two hundred mingles, wine and lees; or twelve steekans, or one hundred and ninety-two mingles racked wine; so that the Bourdeaux ton of wine contains fifty steekans, or eight hundred mingles, wine and lees; and forty eight steekans, or seven hundred and sixty-eight mingles of pure wine. The barrels or poinçons of Nantes and other places on the river Loire, contain only twelve steekans Amsterdam measure. The wine-ton of Rochelle, Cognac, Charante; and the Isle of Rhé, differs very little from the ton of Bourdeaux, and consequently from the barrels and pipe. A ton of wine of Chalosse, Bayonne, and the neighbouring places, is reckoned sixty steekans, and the barrel fifteen, Amsterdam measure.

The muid of Paris contains 150 quarts, or 300 pints, wine and lees; or 280 pints clear wine; of which muid 3 make a ton, and the fractions are,

The muid	} containing	36 setiers
The setier		4 quarts
The quart		2 pints
The pint		2 chopins
The chopin		2 demi-setiers
The demi-setier		2 p issous.

The muid is also composed of pipes, or poinçons, quarteaux, queves, and demi-

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queves: these poinçons of Paris and Orleans contain about 15 steekans Amsterdam-measure, and ought to weigh with the cask 666 lb. a little more or less. In Provence they reckon by millerols, and the millerole of Toulon contains 66 Paris-pints, or 100 pints of Amsterdam, nearly; and the Paris pint is nearly equal to the English wine-quart.

The butts or pipes from Cadiz, Malaga, Alicant, Benecarlo, Saloe, and Mataro, and from the Canaries, from Lisbon, Oporto, and Fayal, are very different in their gauges, tho' in affreightments they are all reckoned two to the ton.

Vinegar is measured in the same manner as wine; but the measures for brandies are different: these spirits from France, Spain, Portugal &c. are generally shipped in large casks called pipes, butts, and pieces, according to the places from whence they are exported, &c. In France, brandy is shipped in casks called pieces at Bourdeaux, and pipes at Rochelle, Cognac, the Isle of Rhé, and other neighbouring places, which contain some more and some less: even from 60 to 90 Amsterdam-verges or veertels, according to the capacity of the vessels, and the places they come from, which being reduced into barrels, will stand as follows, viz.

At Rochelle, Cognac, the Isle of Rhé, and the country of Anis	}	27 veertels	} per barrel.		
At Nants, and several places of Bretagne and Anjou - -				}	19 veertels
At Bourdeaux, and different parts of Guienne - - -					
At Amsterdam and other cities of Hol- land - - - -	}	30 veertels			
At Hamburg and Lu- beck - - - - -				}	30 verges
At Embden - - - -		27 verges			

In Provence and Languedoc, brandy is sold by the quintal, the casks included; and at Bruges, in Flanders, the verges are called sesters of 15 stops each, and the spirit is sold at so much per stop.

Olive-oil is also shipped in casks of various-sizes, according to the custom of the places where it is embarked, and the conveniency of stowage. In England it is sold by the ton of 236 gallons; and at Amsterdam by the ton of 717 mingles, or 1434 pints. In Provence it is sold by millerols of 66 Paris-pints: from Spain and Portugal it is brought in pipes, or

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butts, of different gauges; at the first place it is sold by roves, whereof 40 go to the butt; and at the latter place by almoudas, whereof 26 make a pipe. Train-oil is sold in England by the ton, at Amsterdam by the barrel.

MEASURES of Capacity for Things dry. English dry or corn-measures are raised from the Winchester-gallon, which contains 272 one-fourth solid inches, and ought to hold of pure running water 9 pounds 13 ounces. This seems to stand on the foot of the old wine-gallon of 224 cubic inches, 12 being to 14 twelvethentihs as 224 to 272 one-fourth; but by an act of parliament made in 1697 it is decreed, that a round bushel, 18 $\frac{1}{2}$ inches wide, and 8 deep, is a legal Winchester-bushel. Now such a bushel will only hold 2150.42 cubic inches, consequently the gallon will hold 268.8 cubic inches, the divisions and multiples whereof are in the following table :

English Dry or Corn MEASURE.

Solid inches			
33.6	Pint		
268.8	8	Gallon	
537.6	16	2	Peck
2150.4	64	8	4 Bushels
17203.2	512	64	32 8 Quarter.

In the several parts of Europe, salt, which is a more staple and current commodity than any other, is bought and sold by different measures, according to the several places of its dispatch: at Amsterdam it is sold by the cent of 404 measures, or schepfels, which cent is reckoned to be seven lasts, or 14 tons, and the last is to weigh 4000 lb. the seven lasts making 28000 lb. called the cent of salt, which also contains 208 sacks; though some of this commodity is much heavier than others. In the cities of France, it is sold by the muid, whose size varies according to the different places of its manufacture and dispatch. At Paris this measure is reckoned to contain 12 setiers, or 48 minots, which minot is also divided into other measures. The cent of salt from Marans, Brouage, Sude, and the Isle of Rhé, contains 28 stricken muids, and each muid 24 boisseaux, which yields at Amsterdam 21 $\frac{1}{2}$ lasts, or 23 tons, more or less. In Copenhagen, the said cent renders only 9 $\frac{1}{2}$ lasts, the last being reckoned here equal to 18

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tons, and 50 lasts to correspond with 52 of Coningsberg, at which place the cent produces about 10 lasts, or 40,000 lb. At Riga the said cent yields the same measure as at Coningsberg, and about 6 $\frac{1}{2}$ lasts, of Riga, make the great cent of Amsterdam. The said French cent produces at Dantzick from 11 $\frac{1}{2}$ to 12 lasts, of which lasts from 7 $\frac{1}{2}$, to 7 $\frac{1}{2}$, make likewise the great cent of Amsterdam. At Stetin in Pomerania, the French cent yielded 10 lasts, making 40,000 measure and weight of the said place. In Portugal it is bought by the muid, of which four make a last, and seven the cent of Amsterdam. At Alamat and Ivica it is sold by the modin, which weighs from 27 $\frac{1}{2}$ to 28 hundred weight English.

MEASURE of Wood, for firing. See *Cord of Wood*.

MEASURE for Horses, is the hand, which by statute contains four inches.

MEASURE, the cadence and time observed in poetry, dancing, and music, to render them regular and agreeable. See *Metre*.

MEASURE, in music, the interval or space of time which the person who beats time take between the raising and falling of his hand, in order to conduct the movement sometimes quicker and sometimes slower, according to the music or subject that is to be sung or played.

MECHANICS, that branch of mathematics which considers motion and moving powers, their nature and laws, with their effects in machines. See *Machine*.

The knowledge of mechanics is one of those things, says Mr. Mac Laurin, that serves to distinguish civilized nations from barbarians. It is by this science, that the utmost improvement is made of every power and force in nature; and the motions of the elements, water, air, and fire, are made subservient to the various purposes of life: for however weak the force of man appears when unassisted by this art; yet, with its aid, there is hardly any thing above his reach. It is distinguished, by Sir Isaac Newton, into practical and rational mechanics; the former of which treats of the mechanical powers, viz. the lever, ballance, axis and wheel, pulley, wedge, screw, and inclined plane. See *Lever, Ballance, &c.*

Rational mechanics comprehends the whole theory of motion; shews, when the powers or forces are given, how to determine the motions that are produced by them; and, conversely, when the phenomena

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phenomena of the motions are given, how to trace the powers of forces from which they arise. See *Motion*.

MECHANICAL, whatever relates to mechanics: thus we say, mechanical powers, causes, &c. See *Power*, *Cause*, &c. The mechanical philosophy is the same with what is otherwise called corpuscular philosophy. See *Corpuscular*.

* **MECKLENBURG**, a duchy of Germany, in Lower Saxony, is bounded by the Baltic sea on the north; by Pomerania on the east; by Brandenburg on the south; and by the duchy of Holstein on the west; it being about one hundred miles long, and sixty broad. It was formerly inhabited by the Vandals. It is a very fruitful country, is well watered, and abounds in corn, pastures, and game. It is extremely well seated on the Baltic for a foreign trade, some of the principal hans towns lying in this province, particularly Wismar. It is subject to the dukes of Mecklenburg, and is divided between the dukes of Mecklenburg Strelitz, and Mecklenburg Schwerin. There was a city called Mecklenburg, which was very large; but was destroyed in the wars between the Christians and Vandals.

MEDAL, a piece of metal in the form of coin, intending to convey to posterity the portrait of some great person, or the memory of some illustrious action. The parts of a medal are the two sides, one of which is called the face, or head, and the other the reverse. On each side is the area, or field, which makes the middle of the metal; the rim, or border; and the exergue; and on the two sides are distinguished the type, or the figure represented, and the legend, or inscription. There was formerly no difference between money and medals. An old Roman had his purse full of the same pieces that we now preserve in cabinets. As soon as an emperor had done any thing remarkable, as gaining a victory, giving up a tax, or the like, it was immediately stamped on a coin, and became current through his whole dominions. This was a pretty device to spread abroad the virtues of an emperor, and make his actions circulate; and thus a fresh coin was a kind of gazette, that published the latest news of the emperor. The use of medals is very considerable: they give a very great light into history, in confirming such passages as are true in old authors, in reconciling such as are told in different manners, and in recording such as have been omitted. In this

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case, a cabinet of medals is a body of history. It was indeed the best way in the world to perpetuate the memory of great actions, thus to coin out the life of an emperor, and to put every exploit into the mint. It was a kind of printing before the art was invented; and they have this advantage over books, that they tell their story quicker, and sum up a whole volume in twenty or thirty reverses. They are, indeed, the best epitomes in the world, and let us see, with one cast of the eye, the substance of above an hundred pages. Another use of medals is, that they not only shew the actions of an emperor, but at the same time mark out the year in which they were performed: for as every exploit has its date set to it, a series of an emperor's coins is his whole life digested into annals. A medallist, upon the first naming of an emperor, will immediately tell his age, family and life. To remember where he enters in the succession, he only considers in what part of the cabinet he lies; and by running over in his thoughts such a particular drawer, will give an account of all the remarkable parts of his reign. Nor are medals of less use in architecture, painting, poetry, &c.

MEDALLION, or **MEDALION**, a medal of an extraordinary size, supposed to be anciently struck by the emperors for their friends, and for foreign princes and ambassadors; but that the smallness of their number might not endanger the loss of the devices they bore, the Romans generally took care to stamp the subject of them upon their ordinary coins. Medallions, in respect of the other coins, were the same as modern medals in respect of modern money: they were exempted from all commerce, and had no other value but what was set upon them by the fancy of the owner. Medallions are so scarce that there cannot be any set made of them, even though the metals and sizes should be joined promiscuously.

MEDIAL, or **ALLIGATION MEDIAL**, in arithmetic. See *Alligation*.

MEDIASTINUM, in anatomy, a double membrane continuous to the sternum, situated under it, and adhering firmly to it. The uses of the mediastinum are two. The first is to divide the breast longitudinally into two parts, by which several great purposes are answered. The second general use of the mediastinum is, to support the heart in its pendulous state, for the benefit of its free

U 2 motion,

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motion, especially when we lie on our backs.

MEDIATE, or **INTERMEDIATE**, something that stands between and connects two or more terms, considered as extremes; in which sense it is opposed to immediate.

MEDICINE, *Melicina*, or **PHYSIC**, the art of healing, which, says Boe. have, consists in the knowledge of those things by whose application life is either preserved sound and healthy, or when disordered, again restored to its pristine healthiness. Medicine is undoubtedly of the same date with diseases, and diseases are almost as ancient as the world itself. Men were long their own physicians; and it is hard to fix the time when it first was made an art and profession. In certain countries, those who had been cured of some disease, wrote down how and by what remedies it had been effected, and deposited those accounts in the temples for the instruction of others in the like case. In other places, as Egypt and Babylon, the sick were expost in public, that such as passed by who might have been cured of the same disease, might give them advice. The Egyptians cultivated medicine both more anciently and more learnedly than any other people. The Greeks disputed that glory with them, or at least followed them very close in it. Before the Trojan war, Chiron the Thessalian, surnamed the Centaur, who was Achilles's governor, made himself famous by the cure of wounds, and knowledge of simples. Æsculapius, Chiron's disciple, did not give place to his master. Celsus places Pythagoras, Empedocles, and Democritus, in the number of celebrated physicians. Physicians were distinguished into different classes, namely; empirics, because they followed experience almost entirely; others, of whom Hippocrates was the chief, joined reason with experience, hence called dogmatic, or rational. Hippocrates first applied himself to the study of natural things in general, and afterwards to that of the human body in particular. He made a great proficiency in all the parts of physic. He was born 460 years before Christ, and was contemporary with Democritus. He compiled a body of Greek medicine, which continued a long time sacred and unaltered, and was the standing practice of many ages. At length Aretæus the Cappadocian digested it into an orderly body; after which it was several times altered and improved, till at length it was taken in

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hand by Galen of Pergamus, who lived in the year 131. He ascribed all he knew to Hippocrates, and explained every thing by the rigid doctrines of the Peripatetics; and did both a great deal of service; and a great deal of mischief to the art; he being the first who introduced the doctrine of the elements, the cardinal qualities, the degrees, the four humours, &c. into medicine, and on which he made the whole art depend. Other famous physicians after Hippocrates were Diocles Carystius, Paraxagoras, Chrysiptus, Erasistrates, Herophilus, Serapion, Apollonius, Glaucias, Heraclides, Tarentinus, Dionysius, Crito, Menodotus, Theodas, Asclepiades, Themison, Ihesalus, Soranus, Cælius Aurelianus, Celsus, Oribasius, Aetius, Alexander Trallianus, Paulus Ægineta, Actuarius, Myrepsus, &c. Physic had for some time got almost entirely into the hands of the Arabians, till the end of the fifteenth century, when the original authors, most of which they had translated, came to be read in their own language. At length the immortal Harvey, overturning the whole theory of the ancients, by the discovery of the circulation of the blood, laid a new and certain basis for medicine. Since his time it is improved by sure discoveries in anatomy, chemistry, mechanics, &c.

We are told by Pliny, that Archagathus of Peloponnesus was the first physician who came to Rome, in the consulship of L. Æmilius and L. Julius, A. U. C. 535. that is, the Romans till his arrival used only the simple empiric kind of physic, such as was practised by the first men. It seems, however, that several physicians came from Greece to Rome, though Cato had opposed it with his whole power.

Till Pliny's time, of all professions, that of medicine, gainful as it was, was the only one no Roman had followed, because they thought it beneath them.

Without entirely deciding as to the merit of the ancient and modern physic, they have each their peculiar advantages, which render both highly estimable; and doubtless the experience of many ages must have added considerable lights to the knowledge of the ancients. The new discoveries which have enriched the physic of the moderns may give it the preference to that of the ancients.

Whether we consider our bodies or our medicines, physic must be very precarious. Our bodies are more compounded and

and unequal than other bodies are; most other creatures live on a simple diet, and are regular in their appetites; whereas man feeds almost upon every thing, and where appetite fails, invention is called in to swell the account by high sauces and rich spices. Hence proceed such variety of diseases as distract the physician's skill. A healthy constitution is easily restored when out of order, nature in a great measure does its own work; whereas, in a disordered body, a physician must give a new constitution before he can perfect the cure. Though our *materia medica* be large enough, and to look into our dispensatories, one would think no disease incurable; yet the mischief is, all those fine medicines do not always answer in the application, nor have they been found so sovereign in our bodies as they are in our books: all which things have so distracted our physicians, that they vary even in the most common method. In one age alkalies are in fashion, and in the next acids begin to recover credit: bleeding is practised by one nation, and condemned by their neighbours, &c.

Medicine is divided into five principal branches: the first considers the human body, life, and health, and the effects flowing therefrom; this is called physiology, the doctrine of the æconomy or use of the parts; and its objects are called *res naturales*, or things according to nature.

The second branch considers the diseases of the human body, their differences, causes, and effects: as it considers diseases, it is called pathology; as it inquires into the causes, ætiology; when it examines their differences, it is called nosology; and when it explains their effects, symptomatology. The objects of this branch are called *res præternaturales*, or beyond nature.

The third branch considers the signs or symptoms, and how to apply them to use; so as to judge both in a whole and diseased body what is or will be the degree, order, and effect of the health or disease. This is called *semiotica*. Its objects are things both natural, non-natural, and preternatural.

The fourth branch considers the remedies, and their use, whereby life may be preserved; whence it is called hygiene. Its objects are what we strictly call non-natural.

The fifth furnishes the *materia medica*, its preparation and manner of exhibiting, so as to restore health; and is called *therapeutica*, comprizing the diæte-

tica, pharmaceutica, chirurgica, and iatrica.

MEDICINES, *Medicamenta*, such substances as serve to restore health.

MEDIETAS LINGUÆ, in law, a jury, or inquest impannelled, of which the one half are natives of this land, and the others foreigners.

* MEDITERRANEAN SEA, a great gulph of the Atlantic ocean, reaching from the Straights of Gibraltar to the coast of Syria, having the African coast to the south, and Europe and Asia to the north. It forms several gulphs. The chief straights are those of Gibraltar, Messina, Callipoli, Constantinople, Caffa, and the mouth of the gulph of Venice. The ebbing and flowing of the tide are not perceived but in four places, viz. the harbour of Tunis, the straight of Messina, in the gulph of Venice, and the straight of Negropont.

MEDIUM, in logic, the mean or middle term of a syllogism, being an argument, reason, or consideration for which we affirm or deny any thing; or, it is the cause why the greater extreme is affirmed or denied of the less in the conclusion. Medium, in philosophy, is that space or region through which a body in motion passes to any point; thus æther is supposed to be the medium through which the heavenly bodies move; air, the medium wherein bodies move near our earth; water, the medium wherein fishes live and move; and glass is also a medium of light, as it affords it a free passage. That density or consistence in the parts of the medium, whereby the motion of the bodies in it is retarded, is called the resistance of the medium, which, together with the force of gravity, is the cause of the cessation of the motion of projectiles.

MEDLAR, *Mespilus*, in botany, &c. See *Mespilus*.

MEDULLA OBLONGATA, the lower and medullary part of the cerebrum and cerebellum, formed into a kind of tail, and extended to the great foramen, or hole in the occipital bone of the cranium, where it gives origin to the spinal marrow, and to the nerves of the brain. See *Brain* and *Nerve*.

MEDULLA SPINALIS, or spinal marrow, is a continuation of the medulla oblongata of the brain, and forms, as it were, a tail to that part. It is included in a kind of bony canal, formed by the vertebrae, and in this is continued from the head to the extremity of the os sacrum.

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Marum. Its length is therefore the same with that of the *spina dors*, which is different in persons of different stature. The uses of the spinal marrow are, to give origin to thirty-two pairs of nerves, which are principally distributed to the limbs and external parts; and to secrete and prepare a nervous fluid.

MEDUSA, in fabulous history, the eldest daughter of Ceto and the sea-god Phorcus, went with her two sisters to inhabit the isle of Gorgons, from which name they were called the Gorgons. Neptune falling in love with Medusa, chiefly on account of the beauty of her hair, carried her off, and took her to the temple of Minerva, where he debauched her; when Minerva being enraged at the profanation of her temple, transformed Medusa's hair into snakes, and caused those who looked at her to be turned to stone. But Perseus being furnished with Mercury's winged shoes, and the sword with which he had killed Argus, attacked Medusa, and cut off her head, and from her blood sprung up Pegasus and Chrysaor.

* **MEDWAY**, one of the largest rivers in England. It is characterized by Milton, *Medway the smooth*. It rises in Ashdown forest, in Sussex, and taking its course mostly north-east, passes by Penhurst, Tunbridge, Maidstone, and Rochester, in Kent, beyond which it is separated into two branches by the isle of Sheppy, the one called the East Swale, and the other the West Swale. The latter, which is the principal entrance into this river, is defended by the fort of Sheerness. The East Swale leads to Milton and Faversham, where are some of the finest oyster-beds in the world. But the most remarkable particular about this river is its being the station of the royal navy of Great Britain, most of the first and second rate men of war being built and laid up at Chatham; below which the Medway falls into the Thames. From Rochester to Blackfakes, which is about fourteen miles, the channel of the Medway is so deep all the way, the banks so soft, and the reaches so short, that this is one of the safest and best harbours in the world, eighty-gun ships riding a-float at low water within musket-shot of Rochester bridge. They ride as in a mill-pond or wet dock, only that being moored at the chains, they swing up and down with the tide; but as there is room enough, they cannot swing foul of one another. And no accident has been

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known, except the losing of the Royal Catharine of 100 guns, in the great storm of 1703; when being driven from her moorings, and striking against the bank, she sunk so as never to be weighed up, as she was an old vessel.

* **MEGERA**, in fabulous history, one of the furies, who, according to the poets, were the daughters of Acheron and Night.

MELANCHOLY, in medicine, a species of madness, being a kind of delirium without a fever usually attended with fear, heaviness, and sorrow, without any apparent cause. It is infinitely varied according to the temperament and ideas of the person affected with it.

The causes evidently productive of melancholy, says Boerhaave, are observed to be,

1. All things which fix, exhaust, or disturb the nervous fluid of the brain; such as violent and sudden frights, intense thinking upon any subject, excessive love, watchings, solitude, fear, and hysteric disorders.

2. Such things as hinder and disturb the generation, reparation, circulation, and various secretions and excretions of the blood, especially in the spleen, stomach, omentum, pancreas, mesentery, intestines, liver, uterus, and hemorrhoidal vessels: so that, of consequence, melancholy may be produced by the hypochondriacal disorder; by acute diseases ill cured, and especially a phrenitis and burning fever; by an excess of all the secretions and excretions; by such aliments and drinks as are cold, tenacious, terrestrial, tart, and astringent; by violent heat long protracted and parching the blood; as also by a stagnant, moist, and cloudy air.

3. A naturally black, hairy, dry, slender, and robust constitution of body, a middle age, a quick, penetrating, and discerning genius.

If this disorder continues long, it produces stupidity, epilepsies, apoplexies, madness, convulsions, blindness, surprising fancies, laughter, weeping, singing, sighs, eructations, flatulencies, anxieties; an urine sometimes copious and limpid like water, and at others highly thick; a retention, accumulation of the excrementitious blood in the vessels of the abdominal viscera, and often a sudden excretion of it; obstinate costiveness, frequent spitting of a thin matter, and an incredible ability of enduring watchings, hunger, and cold.

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This disorder has often been cured by a supervening unseemly itch, sometimes resembling an elephantiasis; by numerous and large varices; by a copious discharge from the turgid hæmorrhoidal veins; and an evacuation of the black bile by vomit and stool.

Patients labouring under this disorder are generally injured by all medicines which impair the strength, and evacuate too forcibly; as also by those which throw the humours into too violent commotions, whether cordials, or medicines of whatever other denomination.

Hence the best method of curing this disorder is, after a due observation of the first causes, and the variety of patients constitutions, to accommodate various medicines to these causes, and various constitutions.

The several intentions of cure to be pursued, therefore, are, 1. To rouse, augment, and regulate the fluids of the brain and nerves; which is done, first, by diverting the mind from its usual object to others of an opposite nature: secondly, by inducing cautiously another disposition, or affection of mind, opposite to melancholy: thirdly, by humouring the perverse and false turn of the imagination: or, fourthly, by frequently opposing it with great vigour.

2. To remove those obstructions which are either the cause or the effect of a perverted imagination, by softening, inciding, and stimulating the obstructing matter, by means of mineral waters, whey, visceral, hepatic, and antihypochondriac decoctions, waters invigorated with lixivial or compound salts, laxative preparations of mercury, emetics, motion, exercise, riding, sailing, uterine medicines, and such as promote the lochia, remedies which procure hæmorrhoidal discharges, baths, liniments, and plasters.

3. To alleviate the symptoms by venesection, immersion in cold water, and the use of carminatives and opiates.

4. After due evacuations, to exhibit such things as are from experience known to exhilarate the mind, and corroborate all the parts of the body.

From what has been said, it is obvious that the perfect cure of this disorder, as well as of great many others falsely accounted incurable, consists in the correction of the bilis atra, or melancholic humour.

When melancholy increases so far as to bring on an agitation of the fluids of

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the brain, capable of driving the patient into a raging fury, the disorder is called madness.

This only differs in degree from a dejected melancholy, is its offspring, arises from the same causes, and is generally to be cured by the same medicines.

In madness the muscles are generally surprisingly strong, the patient is afflicted with watchings, incredibly capable of enduring hunger and cold, distracted by terrible imaginations, and subject to those disorders called lycanthropia and cynanthropia; which see.

It is observable, that, upon dissecting those who have died of madness, the brain has been found dry, hard, and friable, with its cortical substance of a yellow colour, and its vessels turgid, varicose, and distended with black and viscid blood.

It is also observable, that, during this disorder, all the excretions have, in like manner, almost ceased.

Unexpected precipitation into the sea, and a submersion in it, continued as long as possible, constitute the principal remedy for it.

Madnesses, obstinate against all remedies, have often been removed upon the approach of varices, hæmorrhoidal discharges, dysenteries, dropsies, copious spontaneous hæmorrhages, tertian and quartan fevers.

Such a sort of madness sometimes arises after the body is, by an autumnal, violent, and long-continued intermittent fever, weakened and exhausted, both by the force of the disease, and repeated venesections and purgings. The madness is also generally brought on again by these very means.

This species of the disorder is only to be cured by the use of restoratives, cardiacs, and corroboratives, long persisted in; but, if it is treated with evacuation, it brings on an atrophy, a weakness, and an unsurmountable foolishness.

But a madness arising in robust vigorous persons in the flower of their age, of hot and plethoric habits, is to be cured by repeated venesections, interposing a brisk purge between each; and when the disorder is alleviated, it is to be treated with opiates and cardiacs. *Boerhaave's Aphorisms.*

MELANE, among physicians. See *Alphas.*

MELANTERIA, in natural history, a very beautiful fossil, of a dense, compact, and regular texture, and of an extremely bright

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bright pale yellow, resembling nothing so much as the purest gold.

MELASSES, or **MOLASSES**. See *Melasses*.

MELICERES, in surgery, a kind of encysted tumours, so called when their contents are of the consistence of honey.

MELILO, *Melilotus*, in botany, a plant which is annual or biennial, and found in flower, in hedges and corn fields, greatest part of the summer.

Melilot has been said to be resolvent, emollient, anodyne, and to participate of the virtues of chamomile. The principal use of the plant has been in clysters, fomentations, and other external applications: it formerly gave name to one of the officinal plasters; which received from the melilot a green colour and an unpleasant smell, without any addition to its efficacy.

MELODY, in music, the agreeable effect of different sounds, ranged and disposed in succession; so that melody is the effect of a single voice or instrument, by which it is distinguished from harmony.

MELON, in botany, says Miller, a distinct genus of plants, the flowers of which consist only of one leaf each, and are wide at the mouth, and divided into several segments, wholly resembling the flowers of cucumbers. Of these also some are male or sterile flowers, having an embryo fruit; others are fruitful or female flowers, having an embryo which ripens into a large fruit of an oval figure, sometimes smooth, sometimes rough, divided into three cells, and containing oblong seeds; each of these cells seems also divided into two.

The proper management and culture of melons is this: the seeds should be procured from good melons, produced in some distant garden; for if sowed on the place where it was raised and ripened, it is very apt to degenerate. This seed should be kept three years before it is sowed, and it should be sowed at two seasons. The first for the early crop, to be raised under frames, should be sown in January or the beginning of February; the second, to be raised under bell or hand glasses, is to be sowed in March, and this is the sowing which produces the general crop of melons, which ripen in July and August. About a week before the time of sowing the seed, some dung should be prepared in a heap with the litter, or some coal ashes, and the same methods used in the early cucumbers, for the first crop: but for the second, which is of more general use, the

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sowing may be upon the upper sides of the hot-beds that were for the early melons or cucumbers, or on a fresh moderate hot-bed. When the young plants are come up, they must be removed to another hot bed, and covered with hand glasses, and watered and shaded till they have taken root; and after this, they must have as much air and sun as the season will permit, and their stalks should be earthed up as they grow, which will vastly strengthen them.

In the beginning of April the plants will begin to shew their rough leaves; a parcel of dung is then to be prepared with litter and coal ashes. The common quantity is a load to five holes; a trench must then be dug, which should be ten inches deep, if the soil be dry, but only three, if it be wet. The dung must be evenly laid in this, and heaped up to three feet high; then the place intended for the holes must be marked out, at each of which must be laid a basket full of light rich earth, thrusting a stick of two feet long into the middle. Then cover the dung all over with the earth, which was dug up out of the trench, laying it smooth, and about three inches thick; then the glasses are to be placed close down over the place where each of the sticks is, and in two days the earth will be warm enough to receive the seedling plants. The sticks are now to be taken out, and the earth formed in the places into a hollow like a basin, that it may retain the water which is given to the plants. The plants are then to be taken up, and two strong and thriving ones put into each of these holes, which must be watered and shaded till they have taken root. The plants having taken root, and thrust out a fourth leaf, the top of each of them should be pulled off, in order to force out shoots from the bottom; and as the weather becomes warmer, the glasses must be raised with stones on the south side, to give them air, and about twice a week they should have a little water.

About the middle of May the stalks of the plants will begin to press upon the glasses on every side, and the glasses are then to be raised up on bricks, to give them room to run out; and they should be pegged down with forked sticks, and turned into a proper direction for their running, so that they may be out of the way of entangling one with another: they should now, if the weather be severe, be sheltered with mats in the night, and watered gently at times. When the stalks

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of the plants are grown to the edges of the bed, the earth must be raised with old dung buried under it, till it be upon a level with the beds, for two feet wide on each side. The branches are here to be trained in a proper course, and the glasses are to be left over the roots of the plants; and after this, what water is given them to be sprinkled all over the plants. When the fruit begins to appear, the waterings must be very gentle on the plants; but it will be proper to soak the earth well with large quantities of water about the beds, which will spread a moisture even to the roots of the plants; from this time the plants should be gently watered twice a week, and that always in the evening. When the melons are grown of the size of a tennis ball, a piece of tile should be laid under each to keep them from the ground. As they afterwards approach to ripeness, they should be turned several times, that they may ripen equally on every side; and if the weather be not very favourable, they should be covered with glasses. If the melon is designed to be eaten as soon as cut, it should be suffered to remain on the plant till it changes pretty yellow, and the stalk begins to separate from the fruit; but if it is to be kept two or three days after cutting, it must be always cut proportionably earlier.

It is a practice with many to take off the leaves about the fruit, that it may have more sun; but it is wrong, and the fruit is always the worse tasted for it, and the skin is hard and tough. *Miller's Gard. Dict.*

When a melon is perfectly fine, it is full, without any vacuity: this is known by knocking upon it, and when cut the flesh must be dry, no water running out, only a little dew, which should be of a fine red colour. Large melons are not to be coveted, but firm and well-flavoured ones.

* **MELPOMENE**, in fabulous history, one of the nine Muses, and the inventress of tragedies. She is commonly represented with a serious countenance, and in a theatrical dress, holding crowns and sceptres in one hand, and a dagger in the other.

MEMBRANE, in anatomy, a pliable texture of fibres, interwoven together in the same plane.

MEMOIRS, in matters of literature, a species of history, written by persons who had some share in the transactions they relate.

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MEMORY, *Memoria*, a faculty of the human mind, whereby it retains or keeps the ideas it has once perceived. See *Idea*.

Memory, says Mr. Locke, is, as it were, the storehouse of our ideas; for the narrow mind of man not being capable of having many ideas under view at once, it was necessary to have a repository in which to lay up those ideas which it may afterwards have use of. But our ideas being nothing but actual perceptions in the mind, which cease to be any thing where there is no perception of them; this laying up of our ideas in the repository of the memory, signifies only this; that the mind has a power, in many cases, to revive perceptions it has once had, with this additional perception annexed to them, that it has had them before. And it is by the assistance of this faculty, that we are said to have all those ideas in our understandings which we can bring in sight, and make the subjects of our thoughts without the help of those sensible qualities which first imprinted them there.

Attention and repetition help much to the fixing ideas in our memories: but those which make the deepest and most lasting impressions, are those which are accompanied with pleasure and pain. Ideas but once taken in and never again repeated, are soon lost; as those of colours in such as lost their sight when very young.

The memory of some men is tenacious even to a miracle: but yet there seems to be a constant decay of all our ideas, even of those which are struck deepest; and in minds the most retentive: so that if they be not sometimes renewed, the print wears out, and at last there remains nothing to be seen.

This faculty other animals seem to have to a great degree, as well as men, as appears by birds learning of tunes, and their endeavour to hit the notes right. For it seems impossible that they should endeavour to conform their voices, as it is plain they do, to notes whereof they have no idea.

MENDICANTS, or begging friars, several orders of religious in Popish countries, without any settled revenues, and are supported by the charitable contributions they receive from others.

MENIALS, in law books, domestic or household servants, who live under their lord or master's roof.

MENINGES, or **MENYNGES**, in anatomy,

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anatomy, a name given to the dura and pia mater of the brain.

MENISCUS, in optics, a lens convex on one side, and concave on the other.

For finding the focus of a meniscus, the rule is, as the difference of the semi-diameters of the concavity and convexity to the semi-diameter of the concavity; so is the diameter of the convexity to the focal distance.

MENSALS, *Menſalia*, in church history, ſuch livings as were formerly united to the tables of religious houſes, and hence called menſal benefices.

MENSES, *Catamenia*, fluors, courſes, in medicine, are the monthly evacuations from the uterus of women not with child, and not giving ſuck.

The common cauſe, ſays Dr. Mead, of the ſtoppage of the menſtrual diſcharges is the blood's lentor; whereby this fluid becomes incapable of forcing the ſphincters of the ducts deſtined by nature for this evacuation. For it is not from the diſturbed arteries of the uterus, which is the common opinion, that the blood iſſues every month, but from veſſels peculiarly appropriated to this office. And this lentor or thickneſs of the blood changes the lively colour of the face into a greeniſh pale and wan complexion.

The proper medicines, in this diſtemper, are thoſe which are capable of increaſing the blood's circulation, and attenuating the viſcid humours: and ſuch are all bitters, joined with aromatics, as alſo many preparations of ſteel. But to theſe ought to be prefixed blood-letting and cathartics blended with calomel. The tinctura ſacra is alſo an excellent medicine.

But of all the moſt powerful emmenagogues, I have found ſo ſingular virtue in black hellebore, that I hardly remember it ever failed answering my expectations. My way of ordering it is, a tea-ſpoonful of tincture of black hellebore in a glaſs of warm water, to be taken twice a day. And I have obſerved this remarkable circumſtance, that whenever, either from a bad conformation of the parts, or any other cauſe, this medicine had not the deſired effect, the blood was forced through ſome other paſſages; which is a manifeſt proof of the great power of this medicine in ſpurring the blood forward.

But likewiſe the menſtrual diſcharges frequently run to exceſs. In that caſe the flux is to be reſtrained; which, after letting blood, is effected both by thoſe medicines which condense and inſpiſſate

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the blood, and by thoſe which allay its heat. Of the firſt ſort, the principal are ſuch as participate of vitriol or alum; eſpecially the tincture of roſes; or a powder compoſed of alum three parts, and dragon's blood one part, melted together. But the heat of the blood, and its conſequence, the flux, is more powerfully checked by the Peruvian bark, than by any other medicine whatſoever. *Mead.*

MENSTRUUM, or **DISSOLVENT**, in cheſtry, a body which, when artiſtically applied to another, divides its ſubtility, ſo that the particles of the ſolvent remain thoroughly intermixed with thoſe of the ſolvend. It was called a menſtrum, becauſe the cheſtiſts, in its application to the ſolvend firſt uſed a moderate fire, for a philoſophical month, or forty days; and hence aroſe the name of menſtrual ſolvent, at length barely a menſtrum. Sir Iſaac Newton accounts for the action of menſtruums from the acids wherewith they are impregnated, which are found to be endued with a ſtrong attractive force, wherein their activity conſiſts.

MENSURATION, *Meſuratio*, the art or art of meaſuring lines, ſurfaces, or ſolids.

MENTHA, mint, in botany, a perennial herb, with ſquare ſtalks, ſerrated undivided leaves ſet in pairs; and ſpikes of monopetalous flowers, each of which is cut into four ſections, and followed by four ſeeds incloſed in the cup.

MENTHA Vulgaris, mint, hartmint, ſpearmint, with oblong, narrow, pointed leaves, joined cloſe to the ſtalk; and ſma l purpliſh flowers ſtanding in long ſpikes on the tops. It is a native of the warmer climates, common in our gardens, and flowers in June and July.

This herb has a ſtrong agreeable aromatic ſmell, and a bitteriſh, roughiſh, moderately warm taſte. It is in general uſe as a reſtringent; ſtomachic, and carminative: in vomitings and weakneſs of the ſtomach, there are perhaps few ſimples of equal efficacy.

MENTHA Piperitis, pepper-mint, a native of this kingdom; and ſo far as is known, of this kingdom only: it has of late been received into general practice as a medicine, and is now raiſed plentifully in gardens, and does not appear to loſe any thing of its virtue with the change of ſoil. This ſpecies of mint has a very penetrating ſmell, a ſtrong and warm taſte, pungent and glowing like pepper, and ſinking as it were into the tongue. It is a medi-

a medicine of great importance in flatulent colics, hysteric depressions, and other like complaints; exerting its activity as soon as taken into the stomach, and diffusing a glowing warmth through the whole system; yet not liable to heat the constitution near so much as might be expected from the great warmth and pungency of its taste.

MERCATOR'S CHART, a projection of the earth's superficies in plano, where the meridians are straight lines, parallel to, and equidistant from each other. The parallels of latitude are also straight lines, and parallel to each other, but the distance between them increases from the equinoctial towards either pole, in the ratio of the secant of the latitude to the radius.

If the superficies of the terrestrial globe be supposed to be taken off, and extended on a plane, so as to make the meridians parallel to each other, and the degrees of longitude every where equal, it is easy to conceive that it must be productive of most notorious errors; for an island in latitude 60° , where the radius of the parallel is only equal to one half of the radius of the equator, will have its length from east to west distorted in a double ratio to what it was on the globe; that is, its length from east to west, in comparison of its breadth from north to south, will be represented in a double proportion to what it really is; whence it follows, that in whatever proportion the degrees of any parallel are increased or diminished, by a projection in plano, the degrees of longitude ought to be increased or diminished in the same ratio; for otherwise the true bearings and distances of places will be lost, as in the case of the plain-chart, where the degrees of latitude and longitude are all equal.

Though this projection is generally called Mercator's projection, yet our countryman Mr. Wright, had long before invented it, demonstrated its use, and shewn a ready way of constructing it, by enlarging the meridian line by a continued addition of secants; but neither of these gentlemen is thought the original author of it, as being hinted by Ptolemy about two thousand years ago.

MERCHANT, one who buys and sells commodities in gross, or deals in exchanges; or that traffics in the way of commerce, either by importation or exportation. Formerly every one who was a buyer or seller in the retail way, was called a merchant, as they are still both

in France and Holland; but here that appellation is given only to those who export and import.

MERCURIAL, consisting of, or relating to mercury.

MERCURIFICATION, in chemistry, the method of separating the mercuries of metals, which is most easily effected by means of a burning-glass; for the metal being placed in its focus, its mercurial parts are said to fly off in smoke, which when condensed and collected, appears to be true quicksilver.

MERCURY, in natural history, a fluid metallic substance, not moistening the hands; perfectly opaque; of a bright silver colour, resembling lead or tin when melted; entirely void of taste and smell; extremely divisible; not congealable in the greatest degree of natural cold. It is the most ponderous of all fluids, and of all known bodies except gold and platinum: its gravity is to that of water nearly as 14 to 1; a cubic foot of quicksilver weighing 947 pounds, whilst a cubic foot of water weighs but 70: it is found to be heavier in winter than in summer, in the proportion of eleven ounces thirty-two grains, to eleven ounces seven grains. In consequence of its great density, it is of all fluids the coldest to the touch: the hand cannot be kept one quarter of an hour in a quantity of quicksilver with safety. Of all fluids likewise it grows hottest, not really, but apparently, from the application of an equal external heat. In a heat below ignition, it totally exhales in extremely thin, subtle, penetrating fumes, which condense into running mercury again: the admission of air, which changes the fumes of the other semi-metals into a powdery calx, has not that effect upon those of quicksilver. It dissolves in all the mineral acids, but with different degrees of facility; and proves itself a menstruum for sundry metallic bodies. It has the greatest affinity with gold; adhering to and dissolving that metal the most readily of all. It unites easily also with silver; less easily with lead; still less so with tin; very difficultly with copper; most of all with iron, to which it seems to have an insuperable repugnance. There are different methods of purifying quicksilver; as straining through leather; trituration or ablution with vinegar; with vinegar and salt, with sope-leys, with rectified spirit of wine, and with aqua-fortis; and distillation, either without addition, or with alkaline salts, quick-lime, or iron-silings.

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The largest quantities of mercury are employed for metallurgical operations: gold and silver are extracted, in the Spanish West Indies, from their ores or matrices, by amalgamation with mercury; and both metals are recovered by the same means, when blended in minute particles with earthy matters, as in filing, or working them. Amalgamated with tin, it makes the foil for looking-glasses, and reflecting balls. It is used also for gilding on silver, for anatomical injections, for weather glasses, and sundry other purposes. In vacuo it appears luminous, and is then called the mercurial phosphorus.

Quicksilver, as a medicine, is a specific against the venereal disease, worms, lice, and all kinds of insects: the venereal distemper is not perhaps to be radically cured without it, but against insects there are other remedies equally if not more effectual. It is commonly supposed to have, of itself, no poisonous quality; but it appears, from experience, manifestly prejudicial to the nerves and the bones. Its ill effects are most observable in those who are exposed to its fumes; which fumes are no other than perfect quicksilver, as any one may be convinced by receiving them on a piece of moist leather or cloth, upon which they will reunite into little globules of mercury. Most people admit a pernicious quality in the fumes, though they deny it to the quicksilver: not considering that the fumes are only the quicksilver itself, divided but not altered by the heat. Even mercurial ointments applied externally have occasioned contractions of the limbs, corruptions of the bones, and other dangerous consequences. How soon do the miners feel its ill effects, though they neither anoint with it, nor swallow it, nor are exposed to the fumes into which it is resolved by fire! They first become paralytic, and fall afterwards into a salivation: their teeth drop out: violent pains in the whole body, particularly in the bones, and at length death succeeds. It may be proper to observe, that the Spanish physicians treat these patients in a different method from that pursued among us and in other countries: they expose them frequently for a considerable length of time to the open air, and give internally nothing but absorbents.

Mercurius dulcis, is sublimate made mild, by combining with it so much fresh mercury, as is sufficient to satiate the redundant acid. Four parts of powdered

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sublimate are ground with three of quicksilver, an operation in which great caution is necessary, to avoid the lighter corrosive particles that fly off, till they are thoroughly incorporated; or, which is much more commodious, digested together in a gentle heat, by which the union will be performed as effectually. The mixture is then sublimed in a glass matrass or phial; the sublimed mats freed from the whitish acid matter about the mouth of the vessel, and from such mercurial globules as may happen to appear distinct, then pulverised, and sublimed again: in this manner the sublimation is repeated six times, by which means the medicine becomes less liable to irritate the first passages, and run off by stool. Mercurius dulcis seems to be the best and safest of the mercurial preparations that can be taken in a solid form. It may be given from fifteen to twenty grains; or, as an alterative, from one to two or three grains.

MERCURY ζ , in astronomy, the smallest of the inferior planets, and the nearest to the sun. See *Planet*. According to Mr. Cassini, the greatest distance of Mercury from the earth is 32704, the mean distance 22000, and the least distance 11296 semi-diameters of the earth: therefore his mean distance will be about 88,000,000 English miles; and the diameter of Mercury is three-fourths of the diameter of the earth, and therefore the globe of Mercury must be two-fifths of that of the earth. Mr. Azout pretends to prove, that though Mercury be so near the sun, the light there is not capable of burning any objects. But Sir Isaac Newton makes the heat of Mercury so great, as to be seven times as much as the heat of our summer sun; which he found, by experiments designedly made by the thermometer, is enough to make water boil. And, therefore, if bodies will not be there enkindled by such a degree of heat, it must be because their degree of density is proportionably greater than that of such kinds of bodies on our earth: wherefore this fiery planet is certainly uninhabitable by such creatures as live on our earth. Dr. Halley, in his observation of Mercury seen in the sun, in the year 1677, at St. Helena, says, that this planet may be seen nine times in the sun, near the ascending node, in the years 1710, 1723, 1736, 1743, 1756, 1769, 1776, 1782, 1789, in October; and four times near the other node, in the month of April, in the years 1707, 1753, 1786, 1799; all within this century.

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MERCURY, in heraldry, a term used in blazoning by planets, for the purple colour in the arms of sovereign princes. See *Blazoning*.

MERCURY, in matters of literature, denotes a book, or other paper, chiefly filled with news; so called from the Pagan deity Mercury, who is said to have been the messenger of the gods.

* **MERCURY**, in pagan worship, the son of Jupiter and Maia, the daughter of Atlas, was born on mount Cylene, in Arcadia, and was suckled by Juno. He early displayed his talent for theft, for being caressed by Vulcan, he stole away his tools; he also took away Jupiter's scepter, and would have taken his thunder-bolts, had they not burnt his fingers. Mercury was also the tutelary god of roads and cross-ways, and though he was a thief, was the guardian of trade and commerce. He was the protector of learning, and the arbiter of all quarrels among the gods: but his most remarkable office was to attend dying men, and conduct their souls to the infernal regions. Some of his most remarkable actions are, his killing Argus; his stealing Apollo's oxen, and metamorphosing Battus into a touch-stone. He had Hermaphroditus by Venus, and several other children by different women. He delivered the god Mars from prison, and fastened Prometheus on mount Caucasus.

He is described by the poets as a fair beardless youth, with flaxen hair, lively blue eyes, and a smiling countenance. He has wings fixed to his cap and sandals, and holds the caduceus (or staff surrounded with serpents with two wings on the top) in his hand, and is frequently represented with a purse, to show that he was the god of gain. The animals sacred to him were, the dog, the goat, and the cock.

MERIDIAN, in astronomy, a great circle of the sphere, passing through the zenith, nadir, and poles of the world; dividing the sphere into two hemispheres, the eastern and western. It is a vertical circle passing through the poles of the world.

To draw a MERIDIAN Line. On an horizontal plane, (plate XXXIII. fig. 1.) from the center C, describe several concentric arches B A, *b a*, &c. and on the same center C, erect a style or gnomon, perpendicular to the plane A C B, a foot or half a foot long. About the time of the tropics before noon, between the hours of nine and eleven in the morning, and

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between one and three in the afternoon, observe the points B *b*, &c. A *a*, where in the shadow of the style terminates. Bisect the arches A B, *a b*, &c. in D, *d*, &c. If then the right line D E bisect all the arches A B, *a b*, &c. it will be the meridian line sought. As the extremity of the shadow is somewhat hard to determine, it will be convenient to have the style flat at the top, and to drill a little hole, noting the lucid spot projected by it, on the arches A B and *a b*, instead of the extremity of the shadow.

Hence, if the meridian line be bisected by a right line O V, drawn perpendicularly through the point C, O V will be the intersection of the meridian, and first vertical, and consequently O will shew the east point, and V the west.

MERIDIAN LINE, on a dial, is a right line arising from the intersection of the meridian of the place, with the plane of the dial; this is the line of twelve o'clock, and from hence the division of the hour-lines begins. See *Dial*.

Magnetical MERIDIAN, a great circle passing through the magnetical poles, to which the magnetic needle, or needle of the mariner's compass conforms itself.

MERIDIAN Altitude of the Sun or Stars. Their altitude when in the meridian of the place where they are observed. Or it may be defined, an arch of a great circle perpendicular to the horizon, and comprehended between the horizon and the sun or star then in the meridian of the place.

To take the MERIDIAN Altitude with a Quadrant. If the position of the meridian be known, and the plane of an astronomical quadrant be placed in the meridian line, by means of the plumb-line suspended at the center, the meridian altitudes of the stars, which are the principal observations whereon the whole art of astronomy is founded, may easily be determined. The meridian altitude of a star may likewise be had by means of a pendulum clock, if the exact time of the star's passage by the meridian be known. Now it must be observed, that stars have the same altitude for the minute before and after their passage by the meridian, if they be not in or near the zenith; but if they be, their altitudes must be taken every minute when they are near the meridian, and their greatest altitude will be the meridian altitudes sought. See the article *Quadrant*.

MERIDIONAL DISTANCE, in navigation, the same with the departure, calling,

easting, or westing, or the difference of longitude between the meridian under which the ship now is, and any other meridian she was before under.

MERIDIONAL PARTS, MILES, or **MINUTES**, in navigation, are the parts by which the meridians in Mr. Wright's chart, commonly, though falsely, called Mercator's, do increase, as the parallels of latitude decrease.

* **MERIONETHSHIRE**, a county in North Wales, bounded by Carnarvonshire and Denbighshire on the north, by Montgomeryshire on the south-east, and by the Irish sea on the west. It is watered with the rivers Dee, the Donay, the Druryd, the Farles, and Llanbeder. It is exceedingly mountainous and rocky, and consequently unpleasant, rough, and unfruitful; however, it has pasture proper for feeding sheep and cattle, by which the inhabitants are chiefly maintained; besides which there are red deer, fowl, and fish, especially herrings. It is about thirty-five miles in length, and twenty in breadth, with about thirty-seven parishes. The market towns are Harlech, Dolgelhe, and Bala.

MERIT, in theology, signifies desert. This term is more particularly used to signify the moral goodness of the actions of men, and the rewards to which those actions entitle them.

MERLIN, *Asfaln*, in ornithology, the least of the hawk kind, but much resembling the haggard-falcon.

MERLON, in fortification, is that part of a parapet which is terminated by two embrasures of a battery.

* **MEROPE**, in fabulous history, daughter of Atlas and Pleione, and one of the Pleiades. She rendered a more obscure light than the rest, because she was married to a mortal, named Sisyphus, but her sisters were married to gods.

MEROPS, the bee-eater, in ornithology, the blue-breasted lippida, with a variegated head; a very beautiful bird, somewhat larger than the common kingfisher.

MERULA, the blackbird, in ornithology, a species of the *turdus*, or thrush kind.

MESENTERY, in anatomy, a thick fat membrane, placed in the midst of the intestines, particularly of the smaller ones, whence it has the name.

MESOCOLON, in anatomy, that part of the mesentery connected with the great guts, especially the colon.

MESPILUS, the medlar, in botany,

a genus of plants, the flower of which is made up of roundish hollow petals; and its fruit is an umbilicated globose berry, containing five osseous and gibbous seeds.

MESENTERS, certain officers chiefly employed under the direction of the secretaries of state, who always are in readiness to be sent with all kinds of dispatches foreign and domestic. They also, by virtue of the secretaries warrants, take up persons for high treason, or other offences against the state.

MESSIAH, the anointed; a title which the Jews gave to their expected great deliverer, whose coming they still wait for: and a name the Christians apply to Jesus Christ, in whom the prophecies relating to the Messiah were accomplished. Among the Jews, anointing was the ceremony of consecrating persons to the highest offices and dignities; kings, priests, and sometimes prophets were anointed: thus Aaron and his sons received the sacerdotal, Elisha the prophetic, and David, Solomon, and others, the royal unction.

* **MESSINA**, a large city of Sicily. It is rich, and well fortified, carrying on a great trade. It is at present about five miles in circumference, and has about sixty thousand inhabitants. It was formerly a free port, and has many magazines of merchandize. It has an harbour in the form of an half Moon, and one of the best in the whole mediterranean, being five miles in circumference, and extremely deep, and the quay belonging to it is above a mile in length, the public buildings and religious houses are very numerous and magnificent. It is defended by a strong castle and other forts, and it exports silk, oil, and fruits; besides which it has great plenty of corn, and excellent wine. Messina submitted to the Spaniards in 1719; but the emperor retook it in 1720; in 1735 the Spaniards got possession of it again, and in 1740 allowed the Turks to have a consul there of their own nation. The archbishop has a very great revenue. It is one hundred and ten miles east of Palermo. Long. 15. 39. E. Lat. 38. 41. N.

METAL. See **METALLIC BODIES**.

Prince's METAL, called *Barb METAL*, a kind of factitious metal, of a beautiful yellow, and disposed to receive a fine polish, lustre, &c. It is prepared, according to Dr. Shaw, as follows: take six ounces of copper, melting it in a wind furnace; add to it one ounce of zink: then stirring the whole well together,

gher, pour out the metal immediately. The copper and zink may be put into the crucible together, if first covered over with the black flux, which prevents the evolution of the zink, or preserves its metalline form.

METAL, in heraldry. There are two metals used in heraldry, by way of colours, viz. gold and silver, in blazonry called *or* and *argent*.

In the common paintings of arms these metals are represented by white and yellow, which are the natural colours of those metals. In engraving, gold is expressed by dotting the coat, &c. all over; and silver, by leaving it quite blank.

METALLIC Bodies, in natural history, such metals as are capable of being worked and considerably extended under the hammer; and semi-metals, those which want that valuable quality.

METALLURGY, *Metallurgia*, according to Boerhave, the whole art of preparing and working metals from the globe, or ore, to the utensil; in which sense, mineralogy, assaying, smelting, refining, smithery, gilding, &c. are only branches of metallurgy. See **MINERALOGY**, &c.

Dr. Shaw however restrains metallurgy to those operations required to separate metals from their ores, for the uses of life. These operations are of two kinds, or smaller and large; with regard to which the whole art of metallurgy may be divided into two parts, assaying and smelting. See **ASSAYING**, &c.

Semi-METALS, metallic fossils, fusible by fire, and not malleable in their purest state.

METAMORPHOSIS, in general, denotes the changing of something into a different form; in which sense it includes the transformation of insects, as well as the mythological changes related by the ancient poets. Mythological metamorphoses were held to be of two kinds, apparent and real: thus, that of Jupiter into a bull, was only apparent; whereas that of Lycaon into a wolf, was supposed to be real.

METAPHOR, *Metaphora*, in rhetoric, a figure of speech, whereby the proper denomination of one thing is applied to another, for the greater elegance of expression.

A metaphor is a simile or comparison intended to illustrate the thing spoken of, without the form of comparison. If any author is obliged to give a large account of things, plain and of common obser-

vation, he must raise and ennoble them by strong and graceful metaphors. This rule Tully has observed in his description of the several parts of this habitable globe, in his book on the Nature of the Gods. So has Virgil, in his Georgics, where he has made his meanest and coarsest subjects fine and admirable, by his judicious use of metaphors; in his perfect lines, the little affairs of shepherds and farmers appear with dignity; his descriptions make the country a paradise, and his touches, as a noble writer expresses it, turns every thing into gold. Those are admirable and beautiful metaphors, in which the properties of rational creatures are applied to animals, and those of animals to plants and trees; this way of treating a subject gives life and beauty to the whole creation. But we receive the strongest pleasure from those bold and comprehensive metaphors, in which, besides the illustration of the subject they are intended to raise and improve, convey to us a fresh and lively image.

METAPHYSICS, *Metaphysic*, *Transnaturalis*, or *Ontology*, a science that treats of being, as such, in the abstract, or in general, not restrained to this or that species of it.

If we are short-sighted, in physical matters, which are nearer our sense, and, in a manner, exposed to our view, how much more must we be bewildered in our search after spiritual abstracted truths, in the consideration of universals? This science proceeds in almost unknown paths, containing very few doctrines of allowed certainty, few principles in which men are universally agreed, scarce any just definition, any exact division, and, consequently, affords large matter for doubts and disputes. Add to this the barbarous terms and perplexed reasonings with which the schools have embarrassed this science. We ought by no means to approve of the design and notion of some contemplative men, who would introduce too great a mixture of metaphysics into the subjects of religion, which ought to be treated with the most familiar plainness of method.

METAPLASMUS, in grammar, a transmutation or change made in a word, by adding, retrenching, or altering a letter, or syllables thereof.

METATARSUS, in anatomy, a fleshy mass lying under the sole of the foot.

METATHESIS, in grammar, a species of the metaplasmus; being a figure whereby the letters or syllables of a word are

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are transposed, or shifted out of their usual situation, as *pistis* for *pristis*; *Lybia* for *Libya*, &c.

METEMPSYCHOSIS, the doctrine of transmigration, which supposes that human souls, upon their leaving the body, become the souls of such kind of brutes as they most resemble in their manners. This was the doctrine of Pythagoras and his followers, who held that the souls of vicious men were imprisoned in the bodies of miserable beasts, there to do penance for several ages, at the expiration of which they returned again to animate men; but if they had lived virtuous, some happier brute, or even a human creature, was to be their lot.

METEOR, in physiology, an imperfect, changeable, and mixt body, or the resemblance of a body appearing in the atmosphere, and formed by the action of the heavenly bodies, out of the common elements. Meteors are of three kinds, fiery, airy, and watery. Fiery meteors consist of a fat sulphureous smoke set on fire; such as lightning, thunder, falling stars, *draco volans*, the *ignis fatuus*, and other phenomena appearing in the air. Airy meteors consist of flatulent and spirituous exhalations, such as winds &c. Watery meteors are composed of vapours or watery particles, variously modified by heat and cold, such as clouds, rain, hail, snow and dew.

METHEGLIN, a sort of drink prepared from water and honey. The best way of making it is as follows: Put as much new honey, naturally running from the comb, into spring-water, as that, when the honey is thoroughly dissolved, an egg will not sink to the bottom, but be just suspended in it. Then boil the liquor for an hour or more, till the egg swims above the liquor; then take it off the fire, and let it cool. When very cool, next morning, it may be bottled up; and adding to it half an ounce of ginger, as much of cloves, as much of mace, and a quarter of an ounce of cinnamon, all grossly pounded, a spoonful of yeast may be added also at the bung to increase its fermentation. When it has done working, it may be closely stopped up, and after it has stood a month it may be drawn off into bottles.

METHOD, *methodus*, the art of disposing things in such a manner, as they may be easily comprehended, either to discover the truth which we ourselves are ignorant of, or to demonstrate it to others, when known.

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Method, with regard to the order of procedure, is usually divided into the method of resolution, or analytic method, whereby we proceed from some general known truth to others which belong to some particular thing; and into the method of composition, or synthetic method, in which we propose some certain general truths, from which we produce particular truths.

If, in the method of resolution, we lay down any axioms, it is not immediately in the beginning, but as they are found necessary in the disquisition; but the case is otherwise in the method of composition.

In both these methods, no proposition should be admitted as true, which is not evident. 2. That the connection of the following proposition with the foregoing be likewise evident in every step.

The laws of the synthetic method will be best drawn from mathematicians, as 1. To offer nothing but what is couched in terms perfectly understood. 2. To build only on clear principles. 3. To prove demonstratively all their consequences, namely, by definitions that have been laid down, axioms that have been granted, and propositions that have been already proved; which become principles to things that follow them.

METHOD, in mathematics, more peculiarly denotes certain particular processes for solving problems.

METHODISTS, a religious sect, who first made their appearance in the year 1740. By the death of Mr. Whitefield, Methodism is supposed to be on the decline.

METONIC CYCLE, in chronology, the same with the cycle of the moon.

METONOMY, in rhetoric, a trope in which one name is put for another, on account of the near relation there is between them. By this trope any of the most significant circumstances of a thing are put for the thing itself.

METOPSCOPY, the pretended art of knowing a person's dispositions and manners, by viewing the traces and lines in the face.

METRE, *Meter*, *Metrum*, in poetry, denotes a system of feet of a proper length.

METROPOLIS, the capital of a country or province. It also denotes an archiepiscopal church.

MEUM, spignel, in botany, an umbelliferous perennial plant, which grows wild in meadows in some parts of England.

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land, and flowers in June. The root of this plant is recommended as a carminative, stomachic, and for attenuating viscid humours, appearing to be nearly of the same nature with that of lovage; differing in its smell, being rather more agreeable, somewhat like that of parsnips, but stronger, and in its taste being less sweet, and more warm or acrid.

MEWING, the falling off, or change of hair, feathers, skin, horns, or other parts of animals, which happens in some annually, in others only at certain stages of their lives; but the generality of beasts mew in the spring.

* MEXICO, or NEW-SPAIN, a large country of North America, subject to the king of Mexico before it was conquered by the famous Cortez. It is bounded on the north by New Mexico; on the east by the gulph of Mexico and the North Sea; and on the south and west by South America, and the South Sea. It is above a thousand miles in length, and is under a viceroy, who is a grandee of Spain, and resides at Mexico, and is changed every five years. It is divided in twenty-three provinces, Mexico being the principal. It contains mines of gold, silver, and other minerals, and is an exceeding good country, whereof Mexico is the capital. It is generally mountainous. The highest mountains are near the coast of the South Sea, and many of them are volcanos. The eastern shore is a flat level country, abounding in bogs and morasses, and overflowed in the rainy season; but is so covered with thickets of bamboo cane, mangroves, and bushes, that the logwood cutters are forced to make their way through it with their hatchets. The hills between the mountains and the flat country are best inhabited, and there the air is most temperate. Within the tropic of Cancer they have annual periodical rains, and when the sun is directly over their heads, it is then their coolest season, because the sun is obscured by clouds, and the flat country is under water. Their fair weather is when the sun is in the southern signs, at the greatest distance from them. The springs and rivers are very low in March, April, and in the beginning of May; then the country affords neither grass nor herbage, unless it is watered; but the trees are always green, and there is fruit almost all the year round. These are the cocoa-trees, of which they make chocolate, vanillas, plantains, pine-apples, coco-

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nuts, sapadillos, avagato pears, guaras, prickly pears, oranges and lemons, with a great variety of gums and drugs. Their forest-trees are a sort of cedar, logwood, maachenen, and many others, whose names are not well determined, so as to be understood by people who have never been there. There were before the arrival of the Spaniards, neither horses, oxen, camels, elephants, rhinoceroses, lions, sheep, hogs, goats, asses, or dogs, except some little ones that could not bark; but they had tygers, bears, elks, picarees, warrees, beavers, opossums, armadillos, guanoes, flying squirrels, different sorts of monkeys, snakes, and a variety of birds and insects, among which the cochineal is most valuable. The present inhabitants of Mexico are native Americans, Spaniards, Creoles, Mestees, that is a mixture between a Spaniard and an American, Negroes, and Mulattoes.

The ancient Mexicans worshipped one supreme god, the planets, and departed heroes, and the Spaniards pretend that they sacrificed men. But now the present inhabitants are all obliged to profess popery, unless they have a mind to be put into the inquisition. The number of the Spanish clergy is very great, and there are many monks and nuns.

* MEXICO, a large city of North America, the capital of New Spain, is seated in Proper Mexico. This was a very large place before the Spaniards entered into the country. It contained about eighty thousand houses, several magnificent temples, full of rich idols, and there were three handsome palaces where the emperor of Mexico resided. This place was besieged by Hernando Cortez, with nine hundred Spanish foot, eighty horse, and two hundred thousand Americans, which his allies had supplied him with. This siege was begun in 1521, and lasted three months, in which time the city was quite ruined. Cortez caused it to be rebuilt, and there is now about thirty thousand houses, which are all of brick or stone, and the Americans are driven into a suburb, which contains about three thousand houses. It is a handsome city, and the streets are strait, broad, and clean, with magnificent structures, palaces, churches, and convents for both sexes. It is also rich in trade. The viceroy of New Spain commonly resides here, and it is a royal audience, a tribunal of the inquisition, an archbishoprick, and an university, with the power of coining money. It is 200
Miles

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Miles from Vera Cruz. Long 103. 12 W.
Lat. 20. 15. N.

MEZERION, or MESEREUM, spurge-olive, a species of thymelaea, which agrees in virtue with the spurge-laurel.

MEZZOTINTO, a particular manner of representing figures on copper, so as to form prints in imitation of painting in Indian ink. The scraping mezzotinto is a kind of engraving, executed by covering the surface of a copper-plate with lines, sunk in it close to each other, in different directions; so that it would, if used for printing in this state, give a black impression, or ground, from the whole: and then taking away or diminishing the effect of the ground, by scraping or burnishing, according to the necessary expression of any given design, such parts of these lines as brings the plate to the same condition, as if lines had been originally cut, correspondently to the manner of other engravings, in those places where they were wanted to express the shades or darker parts of the design. This appears, therefore, in one view, to be an opposite kind of engraving to the others; as in them the shades and darker parts are formed by the destroying part of the lights, of which the whole ground must be considered as at first consisting; whereas in this, the ground being originally all shade, the lights are produced by destroying the necessary parts of those shades. Not only the facility of the work, but the effect of it when finely executed, are great recommendations to this kind of engraving; as the extreme softness of the tints, along with a great force of relief, renders the prints, done this way, that are perfect, more generally pleasing than those engraved in any other manner; which the great number of portraits lately done evinces. It is, however, only with regard to some kind of subjects, that this species of engraving has this merit; portraiture is the great object of its excellence; and some landscapes have been done that are not contemptible; horses also have been attempted with success; and some designs of history, properly adapted, may be brought within its reach. But where any thing besides the portraits of men, and other animals, come in question, there must be a peculiar accommodation of the subject: as its powers, with respect to variety of expression, are much less extensive than those of etching; and consequently fall far short of those of the graver. The principles, on which the fitness or unfitness of subjects for this kind

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of engraving are founded, are of two kinds, the one respecting the proportion of light and shade; the other, the nature of the design with regard to the outline. Such pieces as contain large and clear masses of light, do not succeed at all: but where, on the contrary, there is a large proportion of very dark parts, as in the representations of night scenes, or a large proportion of brown shades, as in the pictures of Rembrandt, Benedette, and Teniers, in some instances, the best effect is produced, and with the least labour. Such pieces likewise, as are of a simple composition, and do not require great force, and variety of expression, as passion and character, are suitable; but where great spirit and freedom are required to give merit, this manner of engraving fails; as it does not admit of those sharp and delicate strokes and touches, which are the means of that expression.

Painting MEZZOTINTO on Glass.—The painting on glass by means of mezzotinto prints is performed by cementing the printed side of the prints to the surface of the glass by the assistance of some glutinous body which will not dissolve in water; and then destroying the texture of the paper by water, so that it may be rubbed entirely off from the cement upon the glass, in the same manner as if the original impression had been made there; by which method a complete drawing of the picture designed is obtained on the glass; and may be coloured by either oil, varnish, or water colours. The method of performing it is as follows:

Procure a piece of the best crown glass as near as possible in size to the print to be taken off; and varnish it thinly over with turpentine, rendered a little more fluid by the addition of oil of turpentine. Then lay the print on the glass, beginning at one end, and pressing it gently down in every part to the other. In order to prevent any vesicles of air being formed, during the operation of laying it on, by the paper touching the cement unequally in different parts, and to settle the whole more closely to the glass, it will not be improper to pass a wooden roller of about two inches diameter, well turned and very smooth, over it. This being done, let the glass with the print cemented on it, be gently dried, till the turpentine be perfectly hard: then let the print be thoroughly moistened with water; and while it continues wet rub off the paper, by rolling it under the finger, till only a thin film remains. When it is dry

dry, varnish it over with oil of turpentine, and you may proceed to paint it either with oil, varnish, or water colours; and the piece, if well executed, will appear on the fore side to be elegantly painted on the glass.

MIASMA, among physicians, denotes such particles as are supposed to arise from distempered, putrifying, or poisonous bodies.

MICHAELMAS, or *Feast of St Michael and all Angels*, a festival of the christian church, observed on the 29th of september.

MICROCOSM, a term chiefly applied to man, who is called the little world, by way of eminence, as being an epitome of all that is wonderful in the great world, or macrocosm.

MICROGRAPHY, *micrographia*, a description of the parts and proportions of objects that are too small to be viewed without the assistance of a microscope.

MICROMETER, an astronomical machine, which by means of a screw, measures extremely small distances in the heavens, &c. to a great degree of accuracy. In some micrometers, an inch is divided into 2800 parts, and in others more.

Notwithstanding the invention of the micrometer is ascribed to M. Huygens, Auzout, and Picard, the two latter having published one in 1666, yet Mr. Townley, in the Philosophical Transactions, reclaims it for one of our countrymen, Mr. Gascoyne. He relates that, from some papers of this gentleman's, he learned, that, before our civil wars, he had invented a micrometer, and had made use of it for some years, in taking the diameter of the planets, distances upon land, the moon's distance, &c.

MICROSCOPE, an optical instrument, whereby very minute objects are represented extremely large and distinct, according to the laws of refraction.

Microscopes are of two kinds, simple and compound. The first sort consists of one glass; the other of two or more. The simple microscope is no other than a convex lens, through which objects appear magnified.

An object seen through this microscope appears magnified nearly in that proportion, which the distance, at which an object would be seen distinctly with the naked eye, bears to the focal distance of the microscope. Thus, let *A B* (plate XXXIII fig. 2) represent the microscope, *C D* an object placed at the focal distance of pa-

rallel rays, or something nearer, that the rays of the same pencil may be parallel to each other, or rather diverging in a small degree, when they enter the eye, this circumstance being requisite to distinct vision; and let the microscope be so small, that all the rays that pass through it from the object may enter the pupil of the eye *E F* at the same time, when placed close to it, as in the figure; for unless it be so small, it will scarce magnify sufficiently to deserve the name of microscope. Things being thus exposed, the angle under which this object appears will be *G I H*, or *C I D*, but this is nearly the same it would have appeared under, had there been no microscope interposed; notwithstanding which, the object is properly enough said to appear magnified by this microscope, because, without that, it could not have been seen distinctly at so small a distance from the eye, but must have been situated eight or ten inches from it; and therefore, since objects appear under a larger angle, the nearer they are to the naked eye, this object appears larger, or is magnified by means of the microscope; in proportion as it is seen distinctly at a less distance with it than without it; that is, nearly as the focal distance of the microscope is to that at which objects are seen distinctly with the naked eye.

An object will also appear distinct, though it be situated at a very small distance from the eye, by being viewed through a small hole in a piece of paper; but then this hole must be made so very small, that, unless the object be strongly illuminated, it will appear very obscurely through it.

The form of a compound microscope is expressed in fig. 3. where *A B* represents a small convex lens, whose focal distance is such, that rays flowing from the point *C* may be collected in *D*; and *E F* is a large lens, whose focus of parallel rays coincides with the point *D*; and *F G* represents an eye so situated, that rays proceeding from an object at *K L* may enter the pupil of it, after having passed through both glasses. These things being disposed in this manner, the object *K L* will appear magnified, and also distinct.

For, first, let *R C S* represent a pencil of rays flowing from the point *C*, these will meet their axis again in the point *D* by supposition, and, crossing there, will enter the lens *E F* diverging from its focus of parallel rays, and will therefore enter the pupil of the eye in directions

M I C

parallel to each other, and concur upon the retina at Q; the object will therefore appear distinct.

Secondly a pencil of rays flowing from another point of the object, as L, will meet their axis in M, and, diverging from thence, will, after being refracted by the lens E F, become parallel with respect to each other; but, with respect to the former, they will converge; because, with regard to them, they diverged before they passed through the lens E F from I, a point farther distant than its focus of parallel rays. They will, therefore, consequently, cross them at some distance from it, suppose at H, where the pupil of an eye being placed to receive them, the point L will be represented at O. And for the same reason, the point K being represented at P, the object will be seen under the angle P H O, or E H F, which is much larger than that under which it would have appeared to the naked eye. It may be remarked here, that when we view an object through an instrument of this kind, we are then in reality looking at the image of that object through a single microscope. Thus M N is the image of that object we see through the lens or single microscope E F; so that the addition of the glass A B is only that we may have an image of the object to look at, larger than the object itself.

The glass situated next the object, is called the object-glass and that placed next the eye, the eye-glass.

In some microscopes there is a third glass placed between the object glass and the image, and is called a middle glass. This is placed there only to bring the rays to a focus the sooner, in order that the image may fall nearer the object glass than it otherwise would do.

The proportion of magnifying in a microscope of this kind, is nearly in a ratio compounded of the proportion which the distance of the image from the object glass bears to its distance from the eye glass, and of that which the distance of the object from the eye, bears to its distance from the object glass.

Catadioptric MICROSCOPE, is that which performs its effects by reflection and refraction conjointly, for it is constructed with a small speculum f e d (plate XXXIII fig. 4) whose focus is at f; and it is plain, that if a small object a b be placed a little further from the speculum than the focus f, there will be formed a large image of it A B; which image will be inverted, and in proportion to the

M I D

object, as the distance C e to the distance f e, as when an object lens was used.

Part of this image is viewed by the eye glass F D, which must be a meniscus; because the image being formed by reflection, it will be more perfect, and admit of a greater charge in the eye glass; and those of the meniscus form are best for this purpose, because the errors of the rays, and consequently the confusion caused thereby, in the refraction made at the convex surface, are, in a great measure, rectified by the contrary refraction at the concave surface.

Another sort of catoptric or reflection microscope is constructed with two speculums a b c d and A B C D (fig. 5) with a central hole in each. The larger speculum is concave, the other convex, and both of equal sphericity. They have their focus at one inch distance, and placed one inch and a half from each other, so that an object O P Q, being placed a little before the smaller speculum, might be nearer the larger one than its center E.

The solar or camera obscura MICROSCOPE depends on the sun-shine, and must be made use of in a darkened chamber, as its name implies. By this microscope a louse may be magnified to the length of five or six feet, or even a great deal more; but it is more distinct when not enlarged to above half that size.

* MIDAS; in fabulous history, a king of Phrygia, who having treated Bacchus with great magnificence, that god offered to grant him whatever he should ask. Midas desired that every thing he touched should be changed into gold. Bacchus consented, and Midas every where found the effects of his touch; but he had soon reason to repent his folly, for wanting to eat and drink, the aliments no sooner entered his mouth than they were changed into gold, which obliged him to have recourse to Bacchus, to beseech him to restore him to his former state; on which the god ordered him to bathe in the river Pactolus, which from thence forward had golden sand. Some time after, being chosen judge between Pan and Apollo, he gave another instance of his bad taste, in preferring Pan's music to Apollo's, on which that god, being enraged, gave him ass's ears.

MIDDLESEX, a county of England, bounded by Hertfordshire on the north; by Essex on the east, from which it is separated by the river Lea; by Surry on the south, from which it is parted by the river

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ver Thames; and by Buckinghamshire on the west, being twenty-four miles long, fourteen broad, and about ninety-five in circumference. It is one of the least counties of England, but is the richest, and if we include London and Westminster; pays more taxes than any ten counties of England. It is divided into six hundreds, and two liberties, and besides the cities of London and Westminster, contains five market towns, viz, Brentford, Edgware, Enfield, Staines, and Uxbridge; with many fine villages, adorned with the seats of the nobility and gentry. It is in the province of Canterbury and diocese of London, and exclusive of the churches in the capital, has seventy-three parishes, besides many chapels of ease. It sends eight members to parliament, viz, four for the city of London, two for the county, and two for Westminster. The air is pleasant and healthful, and the soil extremely fertile, and indeed it can hardly be otherwise, considering the plenty of manure furnished by London: it chiefly consists of pasture and garden grounds, for the supply of the capital; and here the art of gardening is brought to greater perfection than in any other part of Britain. The principal rivers are the Thames, the Coln, the Lea or Lee, and the New River; and there are here many medicinal springs.

MID-HEAVEN, the point of the ecliptic that culminates, or in which it cuts the meridian.

MIDSHIP-BEAM, in naval architecture, that which is situated in the middle of the ship, which forms her extreme breadth, and from which the proportion of the masts and yards are taken,

MIDSHIP-MAN, in the royal navy, a young officer, who walks on the quarter-deck and gangways of a ship, and forwards the commands of the superior officers. They are generally volunteers like the cadets in the army, and serve in expectation of a commission. They must, however, serve six years at sea before they can be qualified to receive it.

* **MILAN**, a large city of Italy, and capital of the Milanese. It is one of the finest cities in Europe, being about ten miles in circumference, and containing three hundred thousand inhabitants, on which account it has obtained the name of Milan the great. It is almost of a circular form, being surrounded with a wall, to which there are ten gates, but is of too great an extent to admit of regular fortifications. Its chief strength consists in

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the citadel, which is one of the strongest fortresses in Italy. This city stands in a fruitful and pleasant plain, and has the advantage of two navigable canals, by which it communicates with the rivers Adda and Tefin. The streets are broad and neat, the squares spacious and handsome, and the houses lofty. It is the see of an archbishop, who is always a cardinal; contains two hundred and thirty churches, has forty convents of men, and fifty of women, with other fraternities, and very large suburbs. The cathedral is a vast structure, about five hundred feet in length, and three hundred in breadth, built of white marble. It stands in the center of the city, and they were upwards of three hundred years in finishing it. The roof is supported by one hundred and sixty white marble pillars, standing in four rows. It was to have had fourteen thousand statues as large as the life: but there are several thousands still wanting. The pavement of this church is more curious than that of St. Peter's at Rome. There are two fine brazen pulpits, each of which runs round a large pillar like a gallery, and is supported by huge figures of the same metal. There are a great many other buildings and curiosities worth taking notice of, particularly the great hospital, which is a magnificent structure, capable of entertaining four thousand infirm people, it having a revenue of seventy thousand crowns a year. The most considerable trade of the inhabitants is in wine, corn, cheese, saffrages, cutler's ware, silk and cotton stuffs, all sorts of artificial flowers, paper, feathers, plate, and particularly silver and gold lace, and gold and silver brocades. The nobility make a very great figure in rich cloaths, coaches, and a numerous retinue of servants, and the women go abroad and enjoy more freedom here than in most other cities in Italy. It is seated on the river Olana, and several small brooks. It is thirty-four miles north-east of Casal, seventy north of Genoa, and two hundred and seventy north-west of Rome. Long. 9. 42 E. Lat. 45. 31. N.

* **MILANESE**, or the dutchy of Milan, a country of Italy, bounded by Switzerland and the country of the Grisons on the north; by the territories of Venice and the duchies of Mantua and Parma on the east; by the Appennine mountains on the south, and by Piedmont on the west; extending about eighty-four miles in length, and sixty in breadth. The chief rivers are the Po, the

the Tesin, the Adda, and the Sessia. The lakes are those of Maggiore, Lugano, and Como. The first is fifty miles in length, and five in breadth, and has its source in Switzerland. The air and climate of this duchy are very agreeable, and the whole country is almost one fruitful plain, producing corn, wine, flax, and all sorts of fruit, and is adorned with a great variety of fine towns, palaces, and convents; insomuch that there is hardly a finer spot of ground in all Europe. The Milanese had formerly dukes of their own, whose family became extinct about two hundred years ago; since which the French and Spaniards have had bloody wars, on account of this duchy; but the emperors of the house of Austria, and the king of Sardinia, have got it in their possession.

MILE, *Mille Passus*, a measure of length or distance, containing eight furlongs, &c.

MILIARY, in general, something resembling millet seeds.

MILIARY FEVER, See *Fever*.

MILITANT, or **CHURCH MILITANT**, the body of christians while here on earth.

MILITARY, belonging to the soldiery or militia.

MILITARY ARCHITECTURE, the same with fortification. See *Fortification*.

MILITARY ART, the science or art of making and sustaining war to advantage.

MILITARY COLUM, among the Romans. See *Column*.

MILITARY WAYS, *Via Militares*, the large Roman roads which Agrippa procured to be made through the empire in Augustus's time, for the marching of troops and conveying of carriages. These were paved from the gates of Rome, to the utmost limits of the empire. See *Road*.

MILITIA, in general, the body of soldiers, or those who make profession of arms. In a more restrained sense, militia denotes the trained bands of a town or county, who arm themselves upon a short warning, for their own defence. So that, in this sense, militia is opposed to regular or stated troops. For the direction and command of the militia, the king constitutes lord lieutenants of each county.

MILK, *Lac*, a white juice which nature prepares in the breasts of women, and the udders of other animals, for the nourishment of their young. It is derived

from the pure chyle, conveyed by the arteries to the breasts, and without any other coction filtered through the glands of which they consist, without undergoing any considerable change.

Milk is a composition of three different parts, butyrous, caseous, and serous; the butyrous parts are the cream and oil that swim a-top; the caseous are the grosser parts, and those that coagulate are made into cheese; the serous are properly a lymph, and make whey. By their own milk, all the known lactiferous animals are nourished, both male and female; and from this alone every such animal prepares all the other parts, both the solid and fluid, by means of the vital actions. It is also certain that men may live for years upon milk alone, and perform all the actions of life, and have all the solid and fluid parts of their bodies perfectly elaborated. The human milk is very sweet and thin; the next is that of asses, then that of mares, then that of goats, and lastly of cows; whence it is prescribed in this order to consumptive persons of weak viscera. Dr. Cheyne extols a milk diet in his writings, particularly his method of cure in diseases of body and mind, his essays on the gout, health, and long life, &c. The best of all other milks is human milk, since it is most adapted to our natures; for which reason it is always to be preferred to the milk of other animals. It ought to be furnished by a sound woman, who uses due exercise, observes a laudable regimen, and is in the prime of her age. It is also best when the breasts are drawn four or five hours after eating; for then the chyle is changed into concocted milk, and begins to assume the nature of the human fluids.

MILL, a machine or engine for grinding corn, &c. of which there are several kinds, according to the various methods of applying the moving power; as water-mills, wind-mills, &c.

In water-mills the momentum of the water is the moving power, and the attrition of the two stones in grinding, is the force to be overcome. Of these there are two kinds, viz. those where the force of the water is applied above the wheel, and those where it is applied below the wheel, the former being called over-shot, and the latter under-shot mills; and to these we may add a breast mill, where the water strikes against the middle of the wheel.

Few people are ignorant, that corn is ground by two mill-stones placed one above

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above the other, without touching. The lower or nether mill-stone is immoveable, but the upper one turns upon a spindle. The opposite surfaces of the two stones, which act to grind the corn, are not plain or flat; but the upper one is hollow, and the under one swells up; each of them being of a conic figure, whose axis indeed is very short in proportion to the diameter of its base; for the upper one being six feet in diameter, is hollowed but about one inch at its center; and the lower one rises but about three fourths of an inch. These two mill-stones come nearer and nearer towards their circumference, whereby the corn that falls from the hopper has room to insinuate between them as far as two thirds of the radius, which is the place where it begins to be ground, and where it makes the greatest resistance that it is capable of; the space between the stones being in that place but about two thirds or three fourths of the thickness of a grain of corn. But as the millers have the liberty of raising or sinking the upper stone a little, they can proportion its distance from the lower one, according as they would have the flour finer or coarser. The circular motion of the upper mill-stone brings the corn out of the hopper by jerks, and causes it to recede from the center towards the circumference, where being quite reduced to flour, it is thrown out of the mill, by the centrifugal force of the stone, through a hole provided on purpose. As the water acts upon an over-shot mill both by impulse and weight, so does it likewise upon a breast-mill, or that where the water comes upon the breast, or middle part of the wheel. And here, though the weight of the water is not so great as in the over-shot mill, being contained in the buckets of the lower quarter only, yet the impulse of the water is much greater, the height of the water being increased nearly the semi-diameter of the great wheel, all other things being equal. If the height of the water remain the same, the aperture of the penstock must be enlarged to nearly twice the area, that the force may be the same; so that to produce the same effect, twice as much water is necessary for a breast-mill as for an over-shot one, every thing else being the same.

As to the under-shot mill, it is evident there can be only the impulse from the water; and therefore, the height of the water remaining the same, there must be a larger aperture of the penstock for the

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discharge of a greater quantity of water in the same time, in order to produce the same effect as in the over-shot or breast-mill; whence a greater expence of water will be made here than in any other mill, and can only be supplied for a constancy by a river; and where this can be had, the under-shot is the easiest, cheapest, and most simple structure a mill is capable of. The diameter of common mill-stones, according to Dr. Desaguliers, is from five to seven feet, and their thickness twelve, fifteen, or eighteen inches; they last thirty-five or forty years; and when they have been long used, so that their thickness is considerably diminished, they are cut anew.

MILL is also used for any machine, which being moved by some external force, makes a strong impression on things applied thereto: such are fulling-mills, paper-mills, mills used in coining, gunpowder-mills, oil-mills, stamping-mills, sugar-mills, &c.

MILL-DEW, *Rubigo*. See *Rubigo*.

MILL-POOL, a flock or pond of water, by the force of which the motion of a water-mill is effected.

The dam of a mill-pool is raised much in the same manner as for fish-ponds.

MILLEFOLIUM, yarrow, in botany, a perennial plant which grows plentifully by the sides of fields and on sandy commons, and is found in flower greatest part of the summer. The leaves and flowers of milfoil are greatly recommended by some of the German physicians, as mild corroborants, traumas, and antispasmodics, in diarrhoeas, hemorrhages, hypochondriacal and other distempers. They promise by their sensible qualities, to be of no inconsiderable activity. They have an agreeable, though weak, aromatic smell, and a bitterish, rough, somewhat pungent taste. The leaves are chiefly directed for medicinal use, as having the greatest bitterness and austerity: the flowers have the strongest and most subtile smell, and promise to be of most efficacy, if the plant has really any such efficacy as an anodyne or antispasmodic. Dr. Crew observes, that the young roots have a glowing warm taste, approaching to that of contrayerva, and thinks they might in some measure supply its place; but adds, that they lose much of their virtue in being dried, from whence it may be presumed that their active matter is of another kind.

MILLENARIANS, or CHILIASTS, a name given to those, who, in the primitive

mitive ages, believed that the saints will one day reign on earth with Christ a thousand years. The former appellation is of Latin original, the latter of Greek, and both of the same import. The Millenarians held, that after the coming of Antichrist, and the destruction of all nations, which shall follow, there shall be a first resurrection of the just alone: that all who shall be found upon earth, both good and bad, shall continue alive; the good, to obey the just, who are arisen, as their princes; the bad, to be conquered by the just, and be subject to them: that Jesus Christ will then descend from Heaven in his glory; that the city of Jerusalem will be rebuilt, enlarged, embellished, and its gates stand open night and day. They applied to this new Jerusalem, what is said in the Apocalypse, ch. xxi. and to the temple all that is written in Ezekiel xxxvi. Here, they pretended, Jesus Christ will fix the seat of his empire, and reign a thousand years with the saints, patriarchs, and prophets, who will enjoy perfect and uninterrupted felicity. This reign of our Saviour on earth is usually styled the millennium, or reign of a thousand years.

MILLEPEDES, the common wood-louse, an oblong insect, with fourteen feet, notched along the sides, rolling itself up into a round ball on being touched; found in cellars; and under stones and logs of wood in cold moist places; rarely met with in the warmer climates. Those which have a white silver-like hue, are accounted the best; and the black the worst. Mil-lepedes, have a faint disagreeable smell, and a somewhat brackish, sweetish, unpleasant taste. They are celebrated as resolvents, aperients and diuretics; in jaundices, asthmas, serophulous and other disorders; but that their virtues are so great as they are generally supposed to be, may be justly questioned, at least when given in the customary doses. Two hundred have been taken every day for some time together without producing any remarkable effect: in large doses, indeed, it is probable that their activity may be considerable; as they are said to have sometimes produced an universal heat and thirst with a pain in the region of the pelves, and sometimes a scalding of urine. These insects may be commodiously swallowed entire, as they spontaneously contract themselves, on being touched, into the form of a pill. In the shops they are commonly reduced into powder. The college of Edinburgh directs two ounces of live millepedes to be slightly

bruised, and digested for a night in a pint of Rhenish wine, after which the liquor is to be pressed through a strainer.

MILLET, MILIUM, the seed of a plant which is refrigerating and drying; it is of bad juice, difficult of digestion, binds the belly, and generates flatulences; it is, however, well known to be a very grateful food to many nations at present. In former times it served to make bread, under a dearth of better corn, as we are assured by Dioscorides, Pliny, Galen, and others of the ancients. Among the Italians, says C. Bauhine, loaves made of millet, which are yellow, are eaten hot by many, not out of necessity, but for their sweetness; but, when this bread is grown hard, it is quite black. Of the flour of millet and milk the Italians make fine cakes, which must be eaten as soon as dressed, or else they become glutinous, and ungrateful to the taste. In former times they made a sort of white puddings of millet, as Pliny tells us. And among the Cossacks and Tartars, their principal food is millet, the crude meal of which they mix with the milk of mares, or with blood drawn from the crural vein of their horses. A pudding, prepared of millet, boiled in milk, with an addition of butter, and sugar sprinkled over it, is much in request among the Germans at present; and these puddings have been long ago introduced into England, and are still in fashion. The flower of millet was formerly used in fomentations for the gripes, and for pains of the head and nerves; it was applied externally in bags, because the use of it in cataplasms was difficult, on account of its friability. If the membrane of the brain happens to be wounded, it is excellently conglutinated, says Archigenes, by infusing thereon the juice of calaminth, and sprinkling it with the dry flour of millet. A decoction of millet, with figs and rasins, is called by Heurnius a noble sudorific and diuretic. Or, take of decoction of millet, boiled till it bursts, four ounces; white wine, two ounces. Let the patient take it hot. *Chesneau.*

Loii. Hist. Plant.

Millet is diuretic and astringent; the seeds are of extraordinary service in diseases of the lungs, and exulcerations of the kidneys; made into a cataplasm, they are anodyne and resolvent. *Hist. Plant. adscript. Boerb.*

Indian MILLET. — It delights in a fat and humid soil; for which reason some sow it in their fields to correct their luxuriance: it was brought from India into

Into Spain, Italy, and other warm countries: they sow it in summer, and reap it in autumn.

The seed is like panic both in taste and temperament. The poorest sort of people in Italy, and the peasants in the Paduan, grind the seed, and make it into loaves which are friable, and afford but little nutriment, being black, difficult of digestion, and binding. In Tuscany they sow it more for the sake of feeding their poultry, than to serve as aliment for men. They, also, give it to their cows, horses and swine. Of the pith of the stalks is prepared an excellent remedy for the struma; the preparation of which see in the Bauhines and Matthiolus; which last author commends, also, the flowers, for uterine fluxes and the dysentery. *Raii Hist. Plant.*

MILLING, in the manufacture of cloth, the same with fulling.

MILLING of Silk, an operation otherwise called throwing. See *Throwing*.

MILLION, in arithmetic, the number of ten hundred thousand, or a thousand times a thousand.

MILT, in anatomy, a name sometimes given to the spleen.

MILT, or **MELT**, a denomination by which some call the roes of fishes.

* **MILTON** (JOHN) a celebrated poet, was descended from an ancient family of that name at Milton, near Abingdon, in Oxfordshire, and was the son of Mr. John Milton, scrivener, in London, where he was born the 9th of December, 1608. He was educated under a domestic tutor, and likewise sent to St. Paul's school, where he discovered such an insatiable thirst after learning, that from his twelfth year he accustomed himself to study till midnight, notwithstanding the weakness of his eyes, and his being subject to frequent pains in the head. He was sent to Cambridge at fifteen years of age, and the same year paraphrased some of the Psalms. At seventeen, he composed several poems, in English and Latin. After he had taken the degree of master of arts in 1632, he returned to his father, and two years after wrote his *Comus*, a mask, and in 1637 his *Lycidas*. His mother dying, he obtained permission from his father to travel. At Paris he conversed with Grotius; and going into Italy, contracted a friendship with the greatest wits and the most illustrious of the learned, and became so great a master of the Italian tongue, that he composed very fine Italian verses. He designed to have

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passed into Sicily and Greece, but being informed of the melancholy news of a civil war being broke out in England, he returned about the time. In 1641 he published Five tracts relating to Church Government, and two years after married Mary Powell, the daughter of a gentleman in Oxfordshire, who about a month after, visiting her father in the country, refused ever to return to her husband. After having published several pieces in favour of divorce, he prepared for a second marriage, which his wife being informed of, found means to see him again, and so earnestly supplicated him to forgive her, that he suffered himself to be softened and took her home, and he had afterwards several children by her; but she at last died in child-bed, as did his second wife, after whose death he married a third. In 1644 Mr. Milton published his Treatise on Education, and his *Areopagitica*, in defence of the liberty of the press, and the following year his *Juvenile Poems*. He continued his studies till after the death of King Charles I. and then published his *Tenure of Kings and Magistrates*. He now became secretary to the council of state. The *Icon Basilike* appearing soon after the death of King Charles I. to whom it was attributed, Milton, at Cromwell's desire, answered it, in a work entitled *Iconoclastes*. At length Salmasius undertaking the defence of Charles I. composed his *Defensio Regia*, against the parliament of England, on which Milton was chosen to answer him. He engaged in that work, though he had almost lost an eye, and though the physicians foretold, that he would certainly lose the other, if he continued. His answer appeared in 1651, under the title, *Pro Populo Anglicano Defensio*, which made much noise, and was burnt both at Paris and at Toulouse, by the hands of the hangman; but though Milton became blind, as had been foretold by his physicians, this did not prevent his publishing in 1654, his book entitled, *Defensio Secunda*, and the following year his *Defensio pro se*. In 1659 he published a Treatise on the Civil power in Ecclesiastical Causes, and other works. At the Restoration he kept himself concealed till after the act of oblivion was passed, and soon after, is said, to have been offered the place of Latin secretary to the king, which he refused. In 1667 he published his *Paradise Lost*. In 1670 he published his *History of England*, and in 1671 his *Paradise Regained*. He published several other works, and

died at Bunhill, on the 15th of November, 1674, leaving several daughters.

A monument was some years ago erected to his memory, in Westminster Abbey, at the expence of William Benson, esq; auditor of the imprest.

MILVUS, the kite, in ornithology, a species of falcon, with a forked tail, a yellow cere, a brown body, and a whitish head. It is a very common bird with us, about the size of a large tame pigeon.

MIND, *Mens, vus*, a thinking intelligent being, otherwise called spirit, in opposition to matter or body. The culture of the human mind is more immediately taught in the sciences of logic and ethics. See *Logic* and *Esbi* s.

When the mind, says Mr. Locke, turns its view inwards upon itself, thinking is the first idea that occurs; wherein it observes a great variety of modifications, whence it frames to itself distinct ideas. See *Idea*.

Thus the perception annexed to any impression on the body by an external object, is called sensation; when an idea recurs without the presence of the object, it is called remembrance; when sought after by the mind, and brought again into view, it is recollected; when the ideas are taken notice of, and as it were registered in the memory, it is attention; when the mind fixes its view on any idea, and considers it on all sides, it is called study. See *Sensation*, *Remembrance*, &c.

MINDEN, Battle of. By an unfortunate stroke at Bergen, the whole plan of operations for the year 1759, was frustrated. In consequence of which, duke Ferdinand retreated, and the duke de Broglie, since created a marechal of France, joined his victorious troops to the grand army, commanded by M. de Contades. The French army after this junction, amounted to at least sixty-eight thousand men, some Gazettes said seventy-five thousand. The allies were not inferior, but were soon after considerably weakened by making detachments for garrisons. Contades pursued, and as he thought, with great caution; he was fortunate in taking such steps, as did not expose him to the enemy, but it was rather the effect of chance than judgment, for oftentimes he was obliged to encamp in those places, where he was happily secure, when he intended to have gone further. This good luck continued with him all June and most part of July. On the thirty-first of this month, 1759, the two armies encamped about the distance

of seven miles from each other. The allies extended from Todtnhausen, almost to Hille, making a line of little less than nine miles, while the French were more compact, they did not take up the space of above three miles. They were a little higher than Minden, having that city and Torsmoor in their front. About evening they struck their tents, and advanced to the moor or marsh, and in the dead of the night proceeded to Minden heath. Marechal Contades drew up his army in a very imprudent manner, if we may credit the report of his own officers, or the dislike they expressed of it. He placed his infantry on the wings, and his cavalry in the center. He expected to find the allies in that disposition; but surely no general would place his infantry on the wings, where there was a probability of being flanked, and as the French army was by much the superior, it could consequently form a larger front; therefore Contades seems strangely erroneous in his judgment, to think that duke Ferdinand should draw up in such a disadvantageous manner on a plain. He also entertained a notion, that the left wing of the duke's army, commanded by lieutenant-general Wangenheim, which extended to the banks of the Weser, was extremely weak, that it consisted rather of a detachment than a wing of the army, because it was separated, and that his main force was at Hille. Certain it is, his main force was near Hille, and Wangenheim's corps was encamped at some distance from it; but still there was a communication between them. On the thirtieth and thirty-first days of July, marechal Contades, having called in all his detachments, by it alarmed the commander of the allied army, who guessed at the marechal's design, and therefore on the thirty-first, at five o'clock in the afternoon, he ordered the army to hold themselves in readiness to march at one in the morning, and gave all his advanced posts a strict charge to be very attentive to the motions of the enemy, during the night, to prevent a surprize. As soon as the French army entered the heath of Minden, marechal Contades detached the duke de Broglie, to attack Wangenheim's corps. But before this could be executed, two deserters came to the tent of prince Ferdinand, and acquainted him with the design of the enemy. They had, indeed, left their regiments four hours before, but still they came time enough to confirm those suspicions,

picious, which reason and experience had suggested. The prince sent advice of it to Wangenheim at three o'clock, and at the same time, sent all the aid-de-camps about him, to every part of the army, with orders to move without the least delay. Broglie's corps appeared before Todtnhausen between three and four o'clock, but did not fire till the cannon of the left wing should play on the village of Hille, which was not till four, then he attacked the advanced guard, but how great was his surprize, when, instead of finding Wangenheim's troops asleep in their tents, as he expected, they were drawn up in order of battle, and had even an intrenched post at Todtnhausen; he however began the attack, by a discharge of cannon, which was at first but faintly returned, but after some more salutes of this sort, they quickly gained the ascendant, and Broglie thought proper to retreat a little. At four o'clock the village of Hille was cannonaded from a battery, which the enemy had erected at Eikhorst. The English officers were alarmed at this, for they had never been made acquainted that the enemy intended to give battle, though the rest of the army had. The marquis of Granby, as soon as he heard the firing, immediately ordered his horse, and sent to lord George Sackville's quarters, to know if there was any orders, and what the firing was; every thing was quiet there, and the messenger returned without having been able to learn any thing. The marquis then repaired to the duke's quarters, and presently found that here it was the enemy had been firing. About this time the army was put in motion, except that part of it under the command of general Wangenheim, which kept its old position at Todtnhausen. By some mistake in the hurry of making ready, the artillery never received orders to advance till very late; the commanding officer enquired after them, and received them from lord George Sackville between six and seven o'clock. As soon as the army had marched through the great wood, and being got on Minden heath, the infantry were formed in sight of the enemy; a body of German cavalry was on their left, which preserved the communication with Wangenheim, and that was all the service they were of, for they were never in the action; another body of cavalry, commanded by lord George Sackville, was on their right, but the wood which ran obliquely and between them, hindered them

from seeing each other. What followed, must astonish every military and common capacity: Six regiments of British infantry, assisted by two of Hanoverian guards, were detached from the right of the line of infantry, to charge the enemy's center, which consisted of sixty squadrons of cavalry; they obeyed this order, and to their eternal honour, by half an hour past eight, drove the enemy before them, without any other assistance, than from the artillery of their own country. In vain did the French cavalry attempt to rally; they could not look this little corps of infantry in the face.——In vain was it taken in front and flank by their artillery, its resolution was not to be daunted; the ground where they marched, was strewed with slaughter and blood, and carnage now paved the path to glory. Just before this brave body of infantry advanced to attack, duke Ferdinand sent captain Winchingham, his Hessian aid-de-camp, with an order to lord George Sackville, to march with the right wing of cavalry, and form a line behind the infantry, which he might do by marching through the wood, which hindered him from seeing the infantry; lord George did not understand how this march was to be made, and made some hesitation concerning the order, which, as the aid-de-camp thought he delivered in a very clear manner, and fully persuaded that lord George understood it, he immediately left him; but as lord George observes, "It is very natural for a person to suppose, that what he means to express, he has expressed plainly, though the person to whom he speaks, finds great difficulty in understanding it." No sooner was Winchingham gone, than colonel Ligonier came to lord George Sackville, with an order from the duke, for his lordship to march with the cavalry under his command, and profit of the disorder which appeared in the enemy's cavalry; upon which his lordship began to advance when colonel Fitzroy arrived with another order from the duke, for him to advance with the British cavalry only. Lord George told them their orders disagreed, "In numbers, my lord," said Fitzroy, but their destination is "the same, to the left." Neither of these gentlemen could tell which came last, as they both sat out at different times, and both were positive in their injunctions. Lord George thereupon went to the duke himself, and having received the order from his own mouth, proceeded to obey

it. But now it was too late to do any service, the little body of infantry had obliged the enemy to retreat, but they did it in extreme good order, by the special care and vigilance of the duke de Broglie, who having made no impression on Wangelheim, drew off to succour the center; and here it is amazing, that the French cavalry did not double up, and inclose those few combatants, for they were at a distance from all their friends. There is evidently great room to charge all the c——s with misconduct, lord G. S. for not immediately obeying the order, brought by captain Winchingham, duke F. for never putting the allied army in a line, and suffering the eight regiments of infantry to be unsustained and uncovered in their flanks, though the rest of the infantry was behind them, and the cavalry of the left wing nearer to them than the cavalry on their right. It may be thought temerity in us to say, that since the commander on the right did not obey, it was but reasonable to assist them with some commander that would. The marechal de Contades was inexcusable for his dispositions, which have often lost his country great advantages; and by which he lost his command, and Broglie, after he joined the center, for not surrounding the detached body of infantry, which would have given them the victory. The French not having been molested by the cavalry of either wing, in their retreat, had an opportunity of regaining their former advantageous camp. They had indeed lost the honour of the day, and missed the stroke which they had meditated. They had likewise lost a great number of men: but all their losses and disgraces might be repaired, and there seemed nothing decisive in the day of Minden. It had certainly happened as it then appeared, if the duke, who foreseeing this, had not formed the plan and detached the hereditary prince of Brunswick at five in the morning of that day. This young hero attacked a large body of the French under the duke de Brissac; this body, though posted in a most advantageous manner, he intirely defeated, and obliged them to take refuge in Minden. The news of this blow came with an ill omen to M. de Contades, in the instant when the English infantry began to engage his center. The enemy themselves could not help admiring the dexterity of the stroke under which they sunk: and full of astonishment at a conduct at once so daring and judicious, paid the just

applause to a general who could detach with security so large a body from his army, when he was going to attack an enemy already much superior to him in numbers. This happy stroke decided the affair; all the passes through which the French could draw succour or provision, were seized. They relinquished their strong post; they fled through Minden, and passing the Weter, retreated to the eastward of that river; thus losing all the advantages which they had made in the campaign, and forced to retreat through a country different from that through which they had advanced, and in which they had taken no measures to procure subsistence. The loss of the French in this action, amounted to about seven thousand men killed, wounded, and prisoners; among whom were many officers of considerable rank. The loss of the allies was not more than two thousand. The English, as they gained the greatest glory, so they were the greatest sufferers: twelve hundred of the killed and wounded were of that nation. The prince, on the day after the battle, paid the due honours to these illustrious corps, as well as to the several of the Hanoverians who had behaved in the same gallant manner. He did justice to the merit of the officers; he distinguished their names; and even particularized so low as captains. To some in the most obliging manner he sent considerable presents; and he omitted nothing to shew that he knew what it is to be well served, and how to encourage the troops and officers to do their duty with spirit and cheerfulness. Although the English had the greatest share in the honour of this signal day, and that the French acknowledged their merit in the strongest terms, yet a cloud was cast over their triumph. There were some expressions in the orders for the rejoicing, which were supposed to convey a very severe reflection on lord G. S. commander in chief of the English forces. The duke required with an emphasis, which seemed particularly pointed, that his orders by his aid-de-camps for the future should be more exactly obeyed. In a manner still less to be misunderstood, he expressed his concern that the marquis of Granby had not had the command of the British cavalry. Had he commanded, his highness made no doubt that the success of the day had been much more complete and brilliant. The severe insinuation concerning the disobedience to orders, and the invidious compliment to a subordinate

ordinate officer, were clear declarations. The news of a victory so glorious to our troops, and of a censure so disgraceful to their commander, came at once to England. In proportion to the joy which filled all hearts, in proportion to their opinion of the great general to whom they owed so seasonable an advantage, was their indignation against the unfortunate commander to whom it was attributed that this advantage was not greater. The public, as usual, judged definitively upon the first charge. They never pardon a general whose error it is to fall short. In vain they are prayed to suspend their judgment, and to wait for a full discussion: the matter is already decided; they have a fact against an officer, and they look upon all reasoning in his favour, not so much as a defence of his conduct, as the exertion of eloquence and artifice to palliate a neglect of duty. This indeed makes the case of officers particularly hard; but then it always shews them what they have to do. The merits of the matter are still regarded in the same light by the public; but the heat, the eagerness, and curiosity of the first movements being over, the matter will be heard whenever it comes to be again discussed with less attention, but with less passion too. It is not for us to deliver any opinion in so nice a controversy; we have in points of less moment hitherto declined it, and we shall always decline it, until the proper judges, before whom it probably will come, shall have taught us what to think. There is indeed no doubt, that if the cavalry of the allies' right wing, situated as it was, had been brought to act at the critical time when it had orders to move, the battle of Minden had proved as decisive as that of Hochstet. But whether it was a fault in the giving or the delivering of the orders, or whether it was some misapprehension in him who received them, we cannot but sincerely pity a commander of such admirable talents, who by the error or the misfortune of a moment, lost an opportunity that would have ranked him for ever with the Marlboroughs and Henrys. A few days after the battle, his lordship resigned his command, and returned to London. He was but a few days in London when he was deprived of all his military employments. The marquis of Granby, whom the opinion of duke Ferdinand, and the desires of the whole army had pointed out, succeeded him in his command. Whilst these

changes were making, duke Ferdinand lost no time to improve his victory by the pursuit of the French. The allies were not indeed able to overtake the main body of their army, but they harassed them extremely, and the French were obliged to sacrifice a great part of their army piece-meal, to preserve the rest entire. The necessity of providing subsistence drove them towards Cassel; the prince pursued them, obliged them to evacuate that place, and once more freed that poor distressed country from the French tyranny. The castle of Ziegenhayn, after an hour's defence, gave the allies about four hundred prisoners. After this, the hereditary prince of Brunswick, equally conspicuous in the greater and the lesser operations of war, made a private march at night (August 27th) in order to surprize a corps of French irregulars, commanded by the famous partisan Fischer, which were posted at Wetter, where it was convenient for the allies to encamp. This corps he entirely routed, killing a great number, and taking four hundred. The French threw a garrison into Marburg, in hopes of putting some stop to the rapid career of the allies. In effect, this did prove an obstacle for some days, but at length the castle surrendered, and the garrison, consisting of between eight and nine hundred men, became prisoners of war. Here a bound was set to the progress of the allied arms; not that they were stopped by any considerable obstruction from the main body of the French in that quarter, but from some effects in another quarter of the unsuccessful beginning of the campaign, from which the battle of Minden had not yet perfectly disengaged them. Munster was still behind them, and still in the hands of the enemy, who had a powerful garrison in that city. M. de Contades, who even after his defeat exceeded the allies in numbers, and had now no further view of an offensive campaign, sent a strong body under d'Armentiers, which was reinforced by some troops from the Lower Rhine to near 15,000 men, to cover that place. Duke Ferdinand had before detached general Imhoff from Cassel, in order to reduce it. On the approach of d'Armentiers, Imhoff was obliged to raise the siege; but being soon after reinforced, the French commander retired in his turn towards Wesel, the possession of which place has all along proved of infinite importance to the French in all their operations.

operations. The siege of Munster was again resumed, but the business threatened to be difficult and tedious. This, however, was the only rub which the allies encountered. In all other respects they were perfectly fortunate. They had driven their enemy two hundred miles before them, and at the end of the campaign, after all their efforts, and all their sanguine hopes of conquest, sat them down just where they had begun it. The event of the battle of Minden, and the subsequent misfortunes of the French arms, threw Versailles into the utmost confusion. The news of that defeat arrived just as the king was taking horse to hunt. He retired, silent and dejected, into the apartment of madam de Pompadour, and for some time saw none of his ministers. The duke of Broglie and M. de Contades mutually accused each other for the ill conduct of that day. The public acquitted Broglie; Belleisle and his general, Contades, lost all reputation; but the duke still preserved his employment, and a considerable part of his influence at court. As soon as the first confusion and surprise of so unexpected an event was a little abated, it was resolved to send reinforcements to their army in Germany, and at the same time to send thither some officer of experience and authority, who might judge and compass, if possible, the differences which subsisted between the commanders; as well as to assist in the deliberations for retrieving their affairs. Public misfortunes call great men from their obscurity. M. de Etrees was chosen on this occasion, and invested with an authority which he unwillingly accepted. When he arrived at the French camp, (September 25th) he could not avoid a sigh, on viewing the ruins of that army, which had triumphed under his command at Hastenbeck. However, his behaviour to M. de Contades, was polite and generous. The old marshal told him, that he was not come to take his command, but to serve under him; and whilst he assisted him with his advice, he would receive his orders. As soon as the officers could leave their posts, lord George Sackville, at his own request, was admitted to a trial by a court-martial. The charge was disobedience of orders, which was proved, but the court incurred the lash of partiality, and the odium of being under the necessity of proving the charge, in order, as it is said, to justify the taking away his commissions. Part of the trial

was afterwards laid before the king, who was pleased to confirm the sentence, that he (lord George) was unfit for any military employment. Partiality and malice never appeared in more striking colours, than in the course of this proceeding; the witnesses for the prisoner were dismissed from their employments; how the evidence for the crown failed, needs no explanation: take colonel S——r for an instance; and admitting lord George to be guilty, observe with what indignity he treats his superior officer, as if it were to shew his own courageous spirit. Those who have read the whole trial, cannot but have noticed the malicious observations of this invidious witness; and however blameable lord George might appear, whose conduct we do not pretend to justify, can the attempts made to support such a witness, be called impartiality? Good manners was the least favour that could be offered the prisoner; if they were by obligation obliged to be partial, they were not by obligation obliged to be un-civil: good manners compose a duty we owe to all mankind, and where this duty is thrown aside, the void is commonly filled with searility and abuse. Even in cases of murder, we have seen the noble prisoner treated with all imaginable respect; in that case life and death were only depending, but in this, reputation and all were at stake.

The orders of His Serene Highness, Prince Ferdinand of Brunswick, relative to the behaviour of the troops under him, at the battle near Minden, on the first of August, 1759.

His serene highness orders his greatest thanks to be given the whole army, for their bravery and good behaviour yesterday, particularly to the English infantry, and the two battalions of Hanoverian guards; to all the cavalry of the left wing, and to general Wangenheim's corps, particularly the regiment of Holstein, the Hessian cavalry, the Hanoverian regiment du corps and Hamerlin's; the same to all the brigades of heavy artillery. His serene highness declares publicly, that next to God, he attributes the glory of the day to the intrepidity and extraordinary good behaviour of these troops, which he assures them he shall retain the strongest sense of as long as he lives; and if ever, upon any occasion, he shall be able to serve these brave troops, or any of them in particular, it will give him the utmost pleasure. His serene highness orders his particular thanks to be likewise

wife given to general Sporken, the duke of Holstein, lieutenant-generals Imhoff and Urff. His serene highness is extremely obliged to the count de Buckeburg, for his extraordinary care and trouble in the management of the artillery, which was served with great effect; likewise to the commanding officers of the several brigades of artillery, viz. Col. Browne, lieutenant-colonel Hutte, major Haffe, and the three English captains, Phillips, Drummond, and Foy. His serene highness thinks himself infinitely obliged to major-generals Waldegrave and Kingsley, for their great courage and good order, in which they conducted their brigades. His serene highness further orders it to be declared to lieutenant-general the marquis of Granby, that he is persuaded, that if he had had the good fortune to have him at the head of the cavalry of the right wing, his presence would have greatly contributed to make the decision of that day more complant and more brilliant. In short, his serene highness orders, that those of his suite whose behaviour he most admired, be named, as the duke of Richmond, colonel Fitzroy, captain Ligonier, colonel Watton, captain Wilson, aid-de-camp to major-general Waldgrave, adjutant-generals Erstoff, Bulow, Durendolle, the counts Tobe and Malerti; his serene highness having much reason to be satisfied with their conduct. And his serene highness desires and orders the generals of the army, that upon all occasions when orders are brought to them by his aid-de-camps, they be obeyed punctually, and without delay.

And his serene highness on discovering a mistake in the preceding order of thanks, to the officers of the British artillery, by which captain Macbean was omitted to be mentioned, his serene highness was pleased to write a letter with his own hand, to captain Macbean, which was delivered by his excellency count I. a Lippe Buckeburg, grand master of the artillery in the allied army, and of which the following is a translation.

S I R,

It is from a sense of your merit, and a regard for justice, that I do in this manner declare, I have reason to be infinitely satisfied with your behaviour, activity, and zeal, which in so conspicuous a manner you made appear at the battle of Todtshausen on the first of August. The talents which you possess in your profession, did not a little contribute to ren-

der our fire superior to that of the enemy; and it is to you and your brigade that I am indebted, for having silenced the fire of a battery of the enemy, which extremely galled the troops, and particularly the British infantry.—

Accept then, Sir, from me, the just tribute of my most perfect acknowledgments, accompanied with my sincere thanks. I shall be happy in every opportunity of obliging you, desiring only occasions of proving it, being with the most distinguished esteem,

Your devoted, and

Entirely affectionate servant.

FERDINAND, Duke of Brunswick and Lunenburg.

To captain Macbean, of the royal British artillery.

Again his serene highness on the third issued the following order:

In the compliment his serene highness made to the troops yesterday, he forgot four regiments that particularly distinguished themselves, viz. Hardenburgh's third battalion of Hessian guards, prince William's, and Gillie's: it is not that his serene highness has reason to complain of any others, but as they had particular opportunities of distinguishing themselves, it is for that reason his serene highness mentions the attention he himself gives to their good conduct:

Head quarters at Bielefeld.

His serene highness duke Ferdinand sent orders to monsieur Hedeman, his treasurer, to pay the following officers of the British artillery the under-mentioned gratuities, as a testimony of his great satisfaction of their gallant behaviour in the late action of the first of this month:

To captain Phillips	1000 crowns
To captain Macbean	500
To captain Drummond	500
To captain Williams	500
To captain Foy	500

I hope the said gentlemen will accept of this present from his highness, as a mark of his particular esteem for them.

Among the papers which were taken at Detmold, on the 5th of August, by his majesty's light troops, an original letter was found, from the marshal duc de Belleisle to marshal Contades, dated Versailles, July 23d, 1759, in which there is the following passage.

I am still afraid that Fischer sets out too late; it is, however, very important, and very essential, that we should raise large contributions. I see no other resource for our most urgent expences, and

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for refitting the troops, but in the money we may draw from the enemy's country; from whence we must likewise procure subsistence of all kinds, (independently of the money) that is to say, hay, straw, oats, for the winter, bread, corn, cattle, horses, even men, to recruit our foreign troops. The war must not be prolonged, and perhaps it may be necessary, according to the events which may happen, between this time and the end of September, to make a downright desert before the line of the quarters, which it may be proper to keep during the winter, in order that the enemy may be under a real impossibility of approaching us: at the same time reserving for ourselves a bare subsistence on the route, which may be the most convenient for us to take, in the middle of the winter, to beat up, or seize upon the enemy's quarters. That this object may be fulfilled, I cause the greatest assiduity to be used, in preparing what is necessary for having all your troops, without exception, well clothed, well armed, well equipped, and well refitted, in every respect, before the end of November, with new tents, in order that, if it should be advisable for the king's political and military affairs, you may be well able to assemble the whole, or part of your army, to act offensively, and with vigour, from the beginning of January, and that you may have the satisfaction to shew your enemies, and all Europe, that the French know how to act, and carry on war, in all seasons, when they have such a general as you are, and a minister of the department of war, that can force, and concert matters, with the general.

You must be sensible, Sir, that what I say to you may become not only useful and honourable, but perhaps even necessary, with respect to what you know, and of which I shall say more in my private letter.

M. Duc de Belleisle.

MINE, in natural history, a place under ground, where metals, minerals, or precious stones, &c. are dug up.

For gold and silver mines, the richest and most celebrated are in the Spanish West-Indies: iron mines are more abundant in France; copper mines are chiefly in Sweden and Denmark; lead and tin mines abound most in England; quick-silver mines in Hungary and Spain; diamond mines in Golconda; salt mines in Poland, &c.

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Metallic-MINES are generally dug for in mountains, though it is probable plains may abound as much therewith, but these are commonly cultivated; besides this, the waters will scarce allow them to dig: and as the metallic veins always run either horizontal or oblique, they are easiest found on the sides of eminences. The metallic veins are commonly encompassed with a sort of stone peculiar to the mine, and accompanied with several strata of clay, gravel, rock, &c. By all these the miners know when they approach a vein. They discover that there is a mine in a mountain by the mineral stones that fall from it, the mineral taste of the waters, the quality of the exhalations, the difference between the earth over the mines, and that of the neighbouring parts; the first freezing on the adjacent places, when it thaws about the mines. Add to this, that the ground producing but little grass, and that but pale, is an indication of a mine.

MINE, in the military art, denotes a subterraneous canal or passage, dug under the wall or rampart of a fortification, intended to be blown up by gun-powder. The alley or passage of a mine is commonly about four feet square; at the end of this is the chamber of the mine, which is a cavity about five feet in width and in length, and about six feet in height; and here the gun-powder is stowed. The faucet of the mine is the train, for which there is always a little aperture left. There are various kinds of mines, which acquire various names, as royal-mines, serpentine-mines, forked-mines, according as their passages are straight, oblique, winding, &c. There are also mines made in the field, which are called fougades.

MINERAL, in natural history, in general, denotes fossil, and is applied to any body dug out of the earth. In this sense minerals are divided into classes; the one fusible and malleable, which are what we properly call metals; the others want these two properties, and are what we strictly call minerals.

MINERAL, in a more accurate sense, denotes a compound fossil, in which there is something discovered, in all respects like metals, except that it is not malleable, joined with some other fossil, as salt, sulphur, stone, or earth such as antimony, cinnabar, bismuth, &c. Some ascribe the formation of minerals to the action of the sun without; some to the central fire within; and some think the cold

gold does all by condensing and congealing certain juices of the earth. The minerals, metals, and stones, lie in beds ever since the flood, if not from the creation: yet it is highly probable they have a faculty of growing in their respective beds, as Mr. Boyle thinks. Among other instances he adds, that in the forest of Dean in Gloucestershire, the best iron, and in the greatest quantities, are found in the old cinders, which they melt over again. This some impute to the negligence of former melters; but Mr. Derham imagines it rather owing to the new impregnations of the old ore or cinders from the air.

MINERAL Waters, in medicine, those wherein any medicinal virtues, besides those of common water, are found. These mineral waters are of various kinds, but they are considered under the general titles of chalybeate, purgative, and alterative. The more useful and commodious additions for examining these three kinds of mineral waters, are, according to Dr. Shaw, galls, syrup of violets, and oil of tartar per deliquium. Galls discover in them any small proportion of vitriol or dissolved iron, as having the property of immediately striking a purple or black colour in all waters where any such substance is lodged. Spirits of violet, in the same manner, discover any small predominance of an acid, or alkali therein, by changing the water red if acid, and green if alkali prevails. Oil of tartar discovers any small proportion of earthy matter less capable of dissolving in water than that salt, by precipitating such earthy matter in form of a white cloud to the bottom of the containing glass, where it collects and appears like a subtile white powder. These particulars may be shewn, and proved satisfactorily by adding to pure water a little of a known acid alkali, dissolved iron, and subtile earth, or fine light sediment of an earthy water; applying the syrup of violets, galls, and oil of tartar respectively.

* **MINERVA**, or **PALLAS**, in Pagan worship, the goddess of sciences and wisdom, sprung completely armed from Jupiter's brain, and on the day of her nativity it rained gold at Rhodes. She disputed with Neptune the honour of giving a name to the city of Athens, when it was agreed between them that whosoever of them should produce what was most useful to mankind, should have that advantage. Neptune, with a stroke of his trident, formed a horse; and Minerva caused an olive to spring from the ground,

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which was judged to be most useful, from its being the symbol of peace. Minerva changed Arachne into a spider, for pretending to excel her in making tapestry. She fought the giants, favoured Cadmus, Ulysses, and other heroes, and refused to marry Vulcan, chusing rather to live in a state of celibacy. She also deprived Fire-bras of sight, turned Medusa's locks into snakes, and performed several other exploits. Minerva is usually represented by the poets, painters, and sculptors, completely armed, with a composed but agreeable countenance, bearing a golden breast-plate and a spear.

MINIATURE, a delicate kind of painting, distinguished from all others by the smallness of the figures; by the faintness of the colouring; and by its being usually done on vellum.

MINIM, in music, a note equal to two crotchets, or half a semibreve.

MINIMS, a religious order in the church of Rome, founded by St. Francis De Paula, towards the end of the fifteenth century. Their habit is a coarse black woollen shift, with a woollen girdle, of the same colour, tied in five knots. They are not permitted to quit the habit and girdle night nor day. Formerly they went bare-footed, but are now allowed the use of shoes.

MINIMUM, in mathematics, the least quantity attainable in any given case. The common methods of resolving problems relating to the minima, are the same with those we have shewn under the article **MAXIMUM**.

MINION, a piece of cannon, at present but little used in the field. For its length, bore, and the weight of the ball it carries. See *Cannon*.

MINIUM, red lead, a preparation of lead used both in pharmacy and painting. Minium is generally prepared, from lead calcined into a grayish powder by keeping it melted over the fire. This powder, ground in mills, is further calcined, in a reverberatory furnace, under a low arch, and frequently stirred with an iron rake, to prevent its melting and running into clots, and to expose a fresh surface to the action of the air and flame. The calcination lasts two or three days. The increase of weight is said to amount to one fourth the weight of the lead; and the lead recovered from the minium to be one twentieth less than the original weight of the metal. If the minium be further calcined, the increase is no more; but the quantity of lead recoverable proves

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less in proportion to the vehemence and continuance of the calcination. The largest quantities of minium are made at Venice, and in England. The Venetians employ for the best sort, cerusse, or white lead: for the middling sort, the refuse plates of lead remaining after the making of cerusse; the worst kind is prepared from litharge. See *Lead, Litharge, &c.*

MINOR, in law, an heir, either male or female, before they arrive at the age of twenty-one; during the minority of such, they are usually incapable of acting for themselves.

MINOR, in logic, the second proposition of a regular syllogism. See *Syllogism*.

MINOR, in music, signifies less, and is applied to certain concords or intervals, which differ from others of the same denomination by half a tone.

MINOTAUR, *Minotaurus*, in antiquity, a fabulous monster much talked of by the poets, feigned to be half man and half bull. The minotaur was brought forth by Pasiphae, wife of Minos, king of Crete. It was shut up in the labyrinth of that island, and at last killed by Theseus.

MIN P, the place where the king's money is coined.

MINT. See *Mentha*.

MINUET, in music, a graceful kind of dance, which consists of a couple, a high step, and a baillance; it begins with a beat, and its motion is triple.

MINUTE, in geometry, the sixtieth part of a degree of a circle.

MINUTE of Time, the sixtieth part of an hour.

MINUTE, in architecture, usually denotes the sixtieth, sometimes the thirtieth part of a module. See *Module*.

MIRACLE, a work effected in a manner different from the common and regular method of Providence, by the interposition either of God himself, or some intelligent agent superior to man.

MIRROR, *Speculum*, in catoptrics, any polished body impervious to the rays of light, and which reflects them equally. Mirrors were anciently made of metal; but at present are generally smooth plates of glass, tinned or quick-silvered on the back part, and called looking-glasses. See *Looking Glass*. The doctrine of mirrors depends wholly on that fundamental law, that the angle of reflection is always equal to the angle of incidence.

The properties of cylindrical mirrors are, 1. The dimensions of objects corresponding lengthwise to the mirror are not

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much changed; but those corresponding breadthwise have their figure altered and their dimensions lessened the farther from the mirror; whence arises a very great distortion. 2. If the plane of the reflection cut the cylindric mirror through the axis, the reflection is performed in the same manner as in a plane mirror; if parallel to the base, the reflection is the same as in a spherical mirror; if it cut it obliquely, the reflection is the same as in an elliptic mirror. Hence, as the plane of reflection never passes through the axis of the mirror, except when the eye and objective line are in the same plane; nor parallel to the base, except when the radiant point and the eye are at the same height; the reflect on is therefore usually the same as in an elliptic one. 3. If a hollow cylindric mirror be directly opposed to the sun, instead of a focus of a point, the rays will be reflected into a lucid line parallel to its axis, at a distance somewhat less than a fourth of its diameter. Hence arises a method of drawing anamorphoses, that is, wild deformed figures on a plane, which appear well proportioned, when viewed in a cylindric mirror. In an elliptic mirror, if a ray strike on it from one of its foci, it is reflected into the other. In parabolic mirrors, as all the rays they reflect meet in one point, they make the best burning-glasses.

MISDEMEANOUR, in law, a heinous offence or fault, particularly in the execution of an office.

MISLETOE, in botany, a bushy evergreen plant; with woody branches variously interwoven; firm narrow leaves, narrowest at the bottom, set in pairs; and imperfect white flowers in their bosoms, followed each by a transparent white berry, containing a single seed. It grows only on the trunks and branches of trees, and may be propagated by rubbing the glutinous berries on the bark that the seeds may adhere.

The leaves and branches of mistletoe, formerly recommended as specifics in convulsive and other nervous disorders, and now fallen into general neglect, do not appear to have any considerable medicinal power.

MISPRISION, in a general sense, some neglect or oversight, as where a person is privy to a treason or felony, committed by another, and neglects to reveal it to the king or his council, or to a magistrate, but entirely conceals them; this is called misprision of those crimes. In cases of misprision

of treason, the offender is to be imprisoned for life, and to forfeit his goods and chattels, together with the profits of his lands, &c. but in misprision of felony, the offender is only to be punished with fine and imprisonment, and to remain in prison till the fine is paid.

MISSAL, the Romish mass-book, containing the several masses to be said on particular days.

MISSEL-BIRD, in zoology the common English name of the larger species of thrush, called also the thrite, and by authors the *turdus viscivorus major*. It is much larger than any other of the thrush kind. Its legs and feet are yellow; its head of a brownish lead colour; and its back, tail, and rump, of the same colour, with an admixture of yellow; but in the summer months it a little changes its colour, and becomes more grey, or of the colour of unripe pickled olives; its throat, breast, and belly, are all variegated with black spots; the middle of its belly whitish, and the upper part of its breast, and part of its sides, and the under feathers of its tail yellowish. *Ray's Ornithology*.

MISSIONARIES, ecclesiastics sent by any Christian church into pagan or infidel countries, to convert the natives, and establish the Christian religion among them.

* MISSISSIPPI, or the river of St. Louis, is one of the largest rivers in the world. Its source is unknown, for it has not been navigated higher than three hundred miles below the fall or cataract of St. Anthony, and there it is thirty fathoms deep, though at the distance of two thousand four hundred miles from its mouth. It discharges itself into the sea by three mouths, and, like the Nile, has periodical inundations, by the melting of snow in the north, so that in May it overflows the country on each side, from sixty to ninety miles, and the inundation continues till near the end of July. Its inundations always leave a great quantity of mud upon the land, and sometimes carry down trees to the river's mouth, where they form new islands, and render the entrance difficult.

MISSIVE, something sent to another, as missive letters, meaning letters sent from one to another upon business, in contradistinction to letters of gallantry, points of learning, dispatches, &c.

MIST, see *Fog*.

MITE, a small coin formerly current, equal to about one third part of a farthing.

MITHRIDATE, *Mithridatium*, in pharmacy, an antidote, in form of an electuary, chiefly against poison. It is so called from its inventor Mithridates king of Pontus; though its present form is different from what he made it. It is one of the capital officinals, consisting of a vast number of ingredients, many of which might have been better left out, as they bear no affinity to the main design of the whole. Mithridate is greatly used as a cordial, an opiate, and a sudorific. Its dose is from one scruple to two drachms, and is a much better medicine, as a cordial and alexipharmic, than the Venice treacle.

MITRALES - VALVULÆ, *Mitral Valves*, in anatomy, two valves situated in the left ventricle of the heart, at the ingress of the pulmonary vein, serving to hinder the ingress and regress of the blood from the heart into the veins again, while they are constricted.

MITRE, a sacerdotal ornament worn on the head by bishops and certain abbots, on solemn occasions; being a sort of a cap, pointed and cleft at top.

MITTIMUS, as generally used, hath two significations: 1. It signifies a writ for removing and transferring of records from one court to another. 2. It also signifies a precept or command in writing, under the hand and seal of a justice of the peace, directed to the gaoler or keeper of some prison, for the receiving and safe keeping of an offender charged with any crime, until he be delivered by course of law.

MIXT, or MIXT BODY, in philosophy and chemistry, that which is compounded of different elements or principles; in which sense it stands contradistinguished from simple or elementary, which is applied to bodies consisting of one principle only, as the chemists take sulphur, salt, &c. to do. The business of chemistry is, to resolve mixt bodies into their principles, or component parts.

MIXT ACTION, in law, an action partly real and partly personal, which lies both for the thing detained, and against the person of the detainer. See *Action*.

MIXTURE, a compound, or assemblage of several different bodies in the same mass.

MIZEN, the aftmost or hindmost standing sail in a ship of three masts. We say standing sail, because there can occasionally be set several flying sails behind it, as the driver, ring-sail, &c.

MIZEN-MAST, the mast on which

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the mizen is fastened, which is the aft-moost or hind-moost in the ship.

MOAT, or **DITCH**, in fortification, a deep trench dug round the rampart of a fortified place, to prevent surprizes. The brink of the moat, next the rampart, is called the *scarpe*, and the opposite one, the *counter-scarpe*. A dry moat found a large place, with a strong garrison, is preferable to one full of water; because the passage may be disputed inch by inch, and the besiegers, when lodged in it, are continually exposed to the bombs, grenades, and other fire-works, which are thrown incessantly from the rampart into their works. In the middle of dry moats, there is sometimes another small one, called *cunette*; which is generally dug so deep, till they find water to fill it. The deepest and broadest moats are accounted the best, but a deep one is preferable to a broad one: the ordinary breadth is about twenty fathoms, and the depth about sixteen. To drain a moat that is full of water, they dig a trench deeper than the level of the water, to let it run off; and then throw hurdles upon the mud and slime, covering them with earth or bundles of rushes, to make a sure and firm passage.

MODE, or **MOOD** of *Syllogisms*, among logicians. See *Syllogism*.

MODE, in music, the particular order of the concinnous degrees of an octave, the fundamental note whereof may be called the key, as it signifies that principal note which regulates the rest. The proper difference, therefore, between a mode and a key is this; that an octave, with all its natural and concinnous degrees, is called a mode, with respect to the constitution or manner of dividing it; and, with respect to its place in the scale, it is called a key.

MODERATOR, in the schools, the person who presides at a dispute, or in a public assembly: thus the president of the annual assembly of the church of Scotland is styled moderator.

MODERN, something new, or of our time, in opposition to what is antique or ancient.

MODIFICATION, in philosophy, that which modifies a thing, or gives it this or that manner of being. Quantity and quality are accidents which modify all bodies. According to Spinoza's system, all the beings that compose the universe are only so many different modifications of one and the same substance; and it is the different arrangement and

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situation of their parts that make all the difference between them.

MODILLIONS, in architecture, ornaments in the cornice of the Ionic, Corinthian, and Composite columns.

The modillions are little inverted consoles, or brackets, in form of an S under the soffit of the cornice, seeming to support the projecture of the larmier; tho' in reality they are no more than ornaments.

MODULATION, in music, the art of keeping in, or changing the mode or key.

MODULE, in architecture, a certain measure or bigness, taken at pleasure, for regulating the proportions of columns, and the symmetry, or disposition of the whole building. Architects generally choose the semi-diameter of the bottom of the column for their module, and this they subdivide into parts or minutes. The module of Vignola, which is a semi-diameter, is divided into twelve parts in the Tuscan and Doric, and into eighteen for the other orders. The module of Palladio, Scamozzi, M. Cambray, Desgodetz, Le Clerc, &c. which is also equal to the semi-diameter, is divided into thirty parts or minutes in all the orders. The whole height of the column is divided by some into twenty parts for the Doric, twenty two and a half for the Ionic, twenty-five for the Roman, &c. and one of these parts is made a module to regulate the rest of the building by. There are two ways of determining the measures, or proportions of buildings. The first is by a fixed standard-measure, which is usually the diameter of the lower part of the column, called a module, subdivided into sixty parts, called minutes. In the second there are no minutes, nor any certain or stated division of the module, but it is divided occasionally into as many parts as are judged necessary: thus the height of the Attic base, which is half the module, is divided either into three, to have the height of the plinth, or into four, for that of the greater torus; for into six, for that of the lesser. Both these manners have been practised by the ancient as well as the modern architects, but the second, which was that chiefly used among the ancients, is, in the opinion of M. Perault, the preferable. As Vitruvius has lessened his module in the Doric order, which is the diameter of the lower part of the other orders, and has reduced that great module to a mean one, which is the semi-diameter,

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ter, the module is here reduced to the third part for the same reason, viz. to determine the several measures without a fraction. For in the Doric order, besides that the height of the base, as in the other orders, is determined by one of those mean modules, the same module gives likewise the height of the capital, architrave, triglyphs, and metopes. But our little module, taken from the third of the diameter of the lower part of the column, has uses much more extensive; for by this the height of the pedestals or columns and entablatures in all the orders are determined without a fraction. As then the great module or diameter of the column has sixty minutes, and the mean module, or half the diameter, thirty minutes, our little module has twenty.

MOERHINGIA, mossy chickweed, in botany.

MOHAIR, in commerce, a kind of fluff made of silk and hair.

MOINEAU, in fortification, a flat bastion raised between two other bastions, when a re-entering angle before a curtain is too long. The moineau is commonly joined to the curtain, but it is sometimes separated from it by a foss, in which case it is called a detached bastion. The moineau is not raised so high as the works of the place, because it ought to be exposed to the fire of the place in case the enemy should lodge themselves in it.

MOISTURE, a term sometimes used to denote animal fluids, the juices of plants, or dampness of the air or other bodies.

Radical MOISTURE, among physicians, a vital fluid, which nourishes and maintains life, as oil does a lamp. However, Dr. Quincy observes, that such a fluid is a mere chimera, unless we thereby mean the mass of blood.

MOLARES, or **DENTES MOLARES**, in anatomy, the large teeth, called in English grinders.

MOLE, *Taipa*, in zoology, makes a genus of quadrupeds, of the order of the feræ, thus characterised: the feet are formed like hands, and calculated for digging; and it has no external ears. Of this genus there are two species: 1. The common mole, a well-known little animal, of a bluish black colour; very mischievous to the farmers, by turning up the ground of their pastures. 2. The pointed tail-less mole, somewhat larger than the common kind: it is of a mixed colour, in which a purplish and yellowish

tinge seem the prevailing ones. It is a native of Asia, and lives under ground, like the common mole.

MOLE, *Mola carnea*, in medicine, a mass of fleshy matter, of a spherical figure, generated in the uterus, or womb, and sometimes mistaken for a child. Its size is various, from that of a large nut to that of a fœtus. Some moles are soft and spongy, and others membranous, with a cavity in the middle. Sometimes they are filled with serous matter, and sometimes with hydatides. The symptoms of a mole, at first, are like those of a real pregnancy; but afterwards they vary; for the woman feels a dull heavy weight, like that of a ball of lead; her belly being round and spherical, without any motion like that of a living fœtus. The mole itself threatens no danger, the difficulty lying in being delivered of it. Some women are troubled with them for several years, and others all their life, without any other inconvenience than uneasiness and weight. The cure consists in expelling the mole; for which purpose the assistance of an expert midwife or surgeon becomes necessary. If the mouth of the uterus should be too strongly contracted to admit the hand of the operator, it is proper to excite the woman's throws by brisk cathartics and strong clysters; while the os uteri, and parts adjacent, are in the mean time gradually relaxed by the application of emollient fomentations, &c. which done, one or two of the fingers are to be first gently insinuated, and then the whole hand by degrees, in order to extract the mole, as directed for the fœtus. See *Delivery*. If the mole adheres to the uterus, as it frequently does, it is to be gently separated before extraction; and if it be too large to be got out entire, it may be carefully separated and extracted in pieces, either with the fingers, or a falciform hook. To conclude, says Heister, if a mole does not occasion any bad symptoms, or uneasiness in the mother, and its extraction appears difficult, no violence should be used; since we have many instances of moles retained in the uterus, without any great detriment to the patient, as long as they lived.

MOLE, *Mols*, is also a massive work of large stones laid in the sea by means of collar-dams; extending before a port, either to defend the harbour from the impetuosity of the waves, or to prevent the passage of ships without leave.

MOLE, a sort of harbour, wherein shipping

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Shipping may ride sheltered from the winds and seas: it is formed by erecting a mole-head; these are not frequent in Great Britain or Ireland, but are more common in the Mediterranean, as Leghorn-mole, Algiers-mole, Alexandria-mole, &c.

MOLE-HEAD, a sort of pier, mound, or artificial isthmus, built athwart the enter part of a little bay, and joining to some head or island, to form a retreat for shipping.

MOLE-HILLS, these little hillocks of earth are a very great prejudice to the pasture lands, not only wasting so much of the land as they cover, but hindering the scythe in mowing. In the West of England they use a peculiar instrument for the breaking up of these; in other places a spade, or other common instrument; and in others a kind of horse-machine, which will destroy as many in one day as a common labourer in eight.

*** MOLIERE** (JOHN BAPTIST POCCUQUIN DE) a celebrated French dramatic poet, who excelled all the comic poets of that nation, was born at Paris in 1620. His father was upholsterer to the king, and obtained for him the survivorship of this post: but his grandfather taking him sometimes to the play, he conceived such an aversion to his own trade, that he desired his grandfather to prevail with his parents to give him a taste of literature, to which his father consented, and he was put to a college of Jesuits, where he became acquainted with Ermand de Bourbon, first prince of Conti, and with Chappelle and Bernier, who studied in the same college. He at length resolved to apply himself entirely to the stage, to which he had a very strong inclination; and having formed a company of some young men, who had a talent for declamation, they played at Paris, and took the name of The Illustrious Theatre. Poccuquin then assumed the name of Moliere, and wrote some short comedies to be acted in the country. The first regular piece he composed was the *Eccurdi*, or *Blunderer*, of five acts, which was performed at Lyons in 1653, and he also played the *Légit Amoureux*, and the *Précieux Ridicules*, before the prince of Conti at Exiers. After visiting several other places, he returned to Paris; he then played in the guard-room of the old Louvre, and was afterwards allowed to act in the royal palace. In 1663 he had a pension of 1000 livres, and two years after his company was taken into the

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king's service; when Moliere introduced a true taste for comedy on the French theatre, and lashed the vices and follies of the age. He was a good actor, as well as an excellent poet. Moliere used to read his comedies to an old servant-maid of his, and when any of the comic passages made little or no impression upon her, he altered them, being convinced by experience, that unless she laughed, they would not take upon the stage. His death was very surprising: being to act *Le malade imaginaire*, that is, The imaginary sick man, he was taken ill before it began, that he was advised to put it off: but considering the number and dignity of the spectators, he was unwilling to send them away, and acted his part with such intemperance, that he did not perceive the increase of his illness; but when he came to that part of the play, in which he was to counterfeit being dead, he was so weak, that it was thought he had really expired; and as they had much difficulty to make him stand up, they advised him to withdraw; but the play being far advanced, he thought he could go through it without further prejudice; but as he was speaking of rhubarb and senna in the consultation of physicians, the blood issued out of his mouth; when being carried home, and all medicines proving ineffectual, he died the same evening of an effusion of blood, the 13th of February 1643, aged 53. Moliere being a player, there was great difficulty in obtaining permission from the archbishop of Paris to inter his body in consecrated ground.

MOLLUGO, bastard madder; in botany.

*** MOLOCH**, in Pagan worship, a famous god of the Ammonites, to whose idol they sacrificed children and animals. It is said to have been half the body of a man with the head of a calf, and the arms extended. This half body was fixed on a kind of hearth, on which was lighted a great fire, through which children were obliged to pass, in order to be purified by that ceremony, when, to prevent their cries being heard, a great noise was made with drums and other instruments. The holy scripture frequently reproaches the Jews for offering these kind of sacrifices to Moloch.

MOLOSSES, in commerce, the thick fluid matter remaining after the sugar is made, resembling syrup. See *Sugar*.

MOLOSSES, in Greek and Latin poetry,

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poetry, a foot composed of three long syllables, as *dele-tant*.

MOLTING, the change of feathers, hair, or horns, in birds and beasts.

MOLLUCCA-BEANS, *Molluccella*, in botany, a genus of plants.

* **MOLWITZ**, Battle at. In the year 1741, when half the powers in Europe were busying themselves about the election of an emperor, Frederic III. the present king of Prussia, who saw the general confusion, marched an army of 60,000 men directly into Silesia. His pretensions were to four duchies, which his family had formerly acquired by purchases, and by acts of confraternity, which his ancestors not being able to maintain, had been obliged to relinquish. The queen of Hungary was incited to find herself attacked in the day of her distress by a prince to whom she had given no sort of provocation; and his Prussian majesty charged the court of Vienna with a design either to assassinate or carry him off by treachery: a design which was disowned with expressions of indignation and disdain, and which was founded in no other place than his own imagination. Both parties were now inflamed. The queen ordered count Neuperg to assemble a body of forces, and stop the progress of the Prussians in Silesia. Accordingly, on Monday the 10th day of April 1741, the two armies met at Molwitz. The engagement began about two o'clock in the afternoon. The Austrians at first drove back the left wing of the Prussians, commanded by lieutenant-general Schuylemberg. But his Prussian majesty having been informed that the Austrians were superior to him in cavalry, had intermixed grenadiers with his horse, by which means this confusion was recovered. The attack on the right wing of the Prussians was likewise very intrepid; but the heat of the action was on the left wing, which having been rallied, now repulsed the Austrians in turn, and pursued their advantage so well, that at six o'clock they began to retire, and made a retreat in very good order, and encamped under the cannon of Neiss, leaving the field of battle to the king, who dearly purchased this spot of ground. He lost at least three thousand men, besides his kinsman Frederic margrave of Brandenburg, and lieutenant-general Schuylemberg. The loss of the Austrians, as they were defeated, must have been greater than that of the Prussians, though they endeavour-

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ed to conceal it; therefore there is no ascertaining it exactly; but according to all probability, it could not be less than four thousand. Notwithstanding the king of Prussia remained master of the field of battle, the action was far from being decisive. The Austrians faced the Prussians several times in their camp, and frequent skirmishes happened. The necessitous affairs of the queen of Hungary at length obliged general Neuperg to be recalled with his army. The king of Prussia then made a conquest of Silesia, for there was no opposition.

MOMENT, in the doctrine of time, an instant, or the most minute and indivisible part of duration. Strictly speaking, however, a moment ought not to be considered as any part of time, but only as the termination or limit thereof.

MOMENT, in the doctrine of infinites, denotes the same with infinitesimal. See *Infinitesimal*.

Leibnitz, and other foreigners, call these moments differences.

MOMENT, *Momentum*, in mechanics, the same with impetus, or the quantity of motion in a moving body; which is always equal to the quantity of matter, multiplied into the velocity; or, which is the same thing, it may be considered as a rectangle under the quantity of matter and velocity.

MOMORDICA, the wild cucumber, in botany, a genus of plants which comprehends the momordica and luffa of Tournefort, and the elaterium of Boerhave; and indeed the elaterium of the shops, a violent purge, is the fruit of this plant.

* **MOMUS**, in fabulous history, the god of raillery, or the jester of the celestial assembly, and was the son of Somnus and Night. He ridiculed both gods and men. Being chosen by Vulcan, Neptune, and Minerva, as a judge of the excellence of their performances, he blamed them all three. Neptune for not placing the horns of the bull before his eyes, that he might give the surer blow, or in his shoulders, that he might give it with greater strength: he censured Minerva for not having rendered her house moveable, that it might be taken away when placed in a bad neighbourhood; and Vulcan, for not having made a window in the breast of the man, by which his heart might be seen, and his most secret thoughts discovered.

MONADELPHIA, in botany, a class of plants, the sixteenth in order, so called

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led because the stamina are connected, or coalesce at the base. See BOTANY.

MONANDRIA, in botany, a class of plants, the first in order, with only one stamen, or male part in each flower.

The monandria are subdivided into two orders, which are denominated monandria-monogynia and monandria-digynia, according as they contain one or two styles.

MONARCHY, a government in which the supreme power is vested in a single person. There are several kinds of monarchies, as where the monarch is invested with an absolute power, and is accountable to none but God. It is an error to suppose, that a despotic or absolute monarch is a solecism in politics, and that there can be none such legally; for the contrary is true, and that in different parts of the world, and from various principles. In China it is founded on paternal authority, and is the basis of the government; in Turkey, Persia, Barbary, and India, it is the effect of religion: and in Denmark, the king is legally absolute by the solemn surrender which the people made to his predecessor of their liberties. Another kind of monarchy is that which is limited, where the supreme power is virtually in the laws, though the majesty of government, and the administration, is vested in a single person. Monarchies are also either hereditary, where the regal power descends immediately from the possessor to the next heir by blood; or elective, where the choice depends upon all who enjoy the benefit of freedom, as in Poland; or upon a few persons in whom the constitution vests the power of election, as in the German empire. See KING and GOVERNMENT.

MONASTERY, a convent or place for the reception and entertainment of monks, mendicant friars, or nuns, whether it be an abbey, priory, &c. Monasteries are governed by different rules, according to the different regulations prescribed by their founders. The first regular and perfect monasteries were founded by St. Pachomius, in Egypt; but St. Basil is generally considered as the great father and patriarch of the eastern monks; since in the fourth century he prescribed rules for the government of the monasteries, to which the Anachorets, and Cœnobites, and the other ancient fathers of the desert submitted. In like manner St. Benedict was styled the patriarch of the western monks: he appeared in Italy towards the latter end of the fifth century,

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and published his rule, which was universally received throughout the West. St. Augustine being sent into England by St. Gregory the pope, in 596, to convert the English, he at the same time introduced the monastic state into this kingdom, which made such progress here, that within the space of two hundred years, there were thirty kings and queens who preferred the religious habit to their crowns, and founded stately monasteries, where they ended their days in solitude and retirement.

MONASTIC, belonging to monks. See MONK.

MONDAY, *Dies Lunæ*, the second day of the week, so called as being anciently sacred to the moon, q. d. moon-day.

MONEY, *Moneta*, a piece of matter, commonly metal, to which public authority has affixed a certain value and weight, to serve as a medium in commerce.

The art of the invention of money is not easily to be settled. There is no room to doubt but that in the earliest ages the ordinary traffic among men, was by trucking or exchanging one commodity for another; but in the course of time it was found necessary, in the way of commutative justice, to have some common measure or standard, according to which all things should be estimated. See EXCHANGE.

By the 13. Geo. III. c. 71, for the better preventing the counterfeiting, clipping, and diminishing the gold coin, it is enacted, that any person to whom gold money shall be tendered, any piece whereof shall be diminished otherwise than by reasonable wearing, or by the impression, colour or weight thereof, he shall suspect to be counterfeit, may cut or deface such piece; and if any piece so cut, broken, or defaced, shall appear to be diminished, otherwise than by reasonable wearing, or a counterfeit, the person tendering the same shall bear the loss thereof; but if the same shall be of due weight, and appear to be lawful money, the person that cut or defaced the same, must receive it at the rate it was coined for.

Money is usually divided into real and imaginary. Real money includes all coins whether of gold, silver, copper, or the like; such as guineas, crowns, pistoles, pieces of eight, ducats, &c.

Imaginary money, or money of account, is that which has never existed, or at least, which does not exist in real specie; but is a denomination invented or

retained

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retained to facilitate the stating of accounts, by keeping them still on a fixed footing, not to be changed in current coins, which the authority of the sovereign sometimes raises or lowers, according to the exigences of the state, of which kinds are pounds, livers, marks, maravedies, &c.

English MONEY of Account is the pound, shilling, and penny; the first and last being imaginary money, and exchanges calculated in one of them two: the pound contains twenty shillings, and the shilling twelve pence.

Scotch MONEY of Account is the pound, shilling, and penny; the pound containing twenty shillings, being equivalent to one shilling and eight pence English; and the shilling containing twelve pennies, equal to a penny English. There is also among them an account of marks, the mark being equivalent to one shilling one penny and one third of a penny English: of this last kind they had formerly a silver coin.

French MONEY of Account is in livers, sols, and deniers, of which twelve deniers make a sol, and twenty sols a livre: their exchange is by the crown of three livres, or sixty sols.

Dutch MONEY of Account is kept at Amsterdam and Rotterdam, the two chief trading places, in guilders, stivers, and penins; so that though goods are sold for other specie, such as livre de gros, &c. yet all are reduced to the above denominations for the entries into their books. The exchanges are made with us in so many shillings to a pound sterling, though in most other places in deniers degrofs.

Spanish MONEY of Account is at Cadiz kept in rials of plate and its fractions; at Castile, in maravedies; at Valentia, in livers and dollars, sueldos and dineros; of which last twelve make a sueldo, and twenty sueldos a liver or dollar. Seventeen quartos at Cadiz and Castile make two rials vellon, which is now an imaginary coin, though formerly it was the principal one of the kingdom. A maravedie is another imaginary specie, of which seventeen is reckoned to a rial vellon. The ducat is also a fictitious coin of eleven rials of plate in purchases, sales, and other mercantile transactions, except in exchanges, when it is valued at eleven rials of plate and one maravedie, or 375 maravedies.

Portuguese MONEY of Account is kept in reas or res, making a separation at

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every hundred, thousandth, &c. 800 reas go to a moidore.

German and Swiss MONEY of Account, at Coningsberg, Elbing, and Dantzic, accounts are kept in rixdollars and gros, or in Polish guilders, gros, and deniers or penins. They exchange on Amsterdam in Polish gros for a livre de gros of six guilders current money of Amsterdam, and on Hamburg for the rixdollar. At Lubeck accounts are kept in marks, schellings, and deniers or penins-lubs, in which their exchanges are made. At Breslaw, accounts are kept in rixdollars and silver gros and penins; in the first of which species exchanges are made on Amsterdam for a certain number of stivers, bank money, and on Hamburg for rixdollars of Breslaw, against rixdollars of Hamburg bank. At Hamburg, accounts are kept in marks, schellings, and deniers lubs bank money, by those who have cash in the bank; but by those who have not, their books are generally kept in rixdollars, schellings, and denier current money. At Bremen, accounts are kept in rixdollars and gros, and it exchanges on Amsterdam rixdollars of seventy-two gros for rixdollars of fifty stivers banco. At Leipzig and Naumbourg, accounts are kept in rixdollars, crowns, gros, and penins. At Berlin, and in all this kingdom, accounts are kept in guilders, gros, and penins. At Zurich, accounts are kept in rixdollars, worth about 4s. 6d. sterling, at 108 of their creutzers. At Frankfort on the Maine, and Hanau, accounts are kept in rixdollars and creutzers. At Vienna, accounts are kept in guilders, creutzers, and penins, reckoning eight penins to a creutzer, and sixty creutzers to a guilder. At Nuremberg and Augsburg, accounts are kept in guilders, creutzers, and hellers; at Leige, in livres, sols, and deniers.

In the canton of St. Gall, in Switzerland, accounts are kept in guilders, creutzers, and penins; or under the same denomination with the coins of the empire. In the canton of Basil, accounts are variously kept, some in rixdollars, schellings and deniers; some in livres, schellings, and deniers; some in rixdollars, creutzers, and penins; and some in guilders creutzers, and penins.

Italian MONEY of Account. In the cities of Genoa and Novi, accounts are kept in livres, soldi, and denari; or in dollars of 100 soldis. At Milan, accounts are kept in livres, soldis, and denari, to be counted like pounds, shillings,

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and pence, viz. twelve denaris to a soldi, &c. At Rome, accounts are kept in crowns, julios, and bajoches, or grains and quartrins; the crown is divided into ten julios, and the julio into ten bajoches. At Leghorn, accounts are generally kept in dollars, soldi, and denari. At Florence, they keep their books and accounts, in crowns, soldi, and denari, picoli or current money. At Naples, accounts are kept in ducats, florins, and grains. The accounts in Sicily are kept the same as at Naples. At Lucca they keep their accounts in crowns, livres, soldi, and denari; the crown is worth 7 livres 10 soldi; the livre 20 soldi; and the soldi 12 denari. At Venice, accounts are kept in livres, soldi, and denari, picoli or current; but the bank-entries are in livres, soldi, and grosses: both the current and bank-ducats of Venice make 24 soldi, or 6 livres and four soldi. At Bologna, accounts are kept in livres, soldi, and denari; the livre being 20 soldi, and the soldi 12 denari. At Bergamo, the money of account is the same as at Bologna, and its proportions the same. At Parma, accounts are kept in crowns, soldi, and denari; the crown is 20 soldi, and the soldi 20 denari. At Modena and Mantua, accounts are kept in livres, soldi, and denari. In Savoy and Piedmont, accounts are kept in livres, or livres, soldi, and quartrins. At Placentia, accounts are kept in crowns, soldi, and denari of mark; of which 12 denari make a soldi, and 20 soldi the crown. In the island of Sardinia, accounts are kept as in most parts of Italy, in livres, soldi, and denari. In the island of Malta, the money of account is the same with that of Sicily. In the island of Candia, the account is the same as at Venice.

Russian, Swedish, Danish, and Polish MONEY of Account. In the trading places of the Russian empire, accounts are kept in roubles, grives, and moscosques, or in roubles and coppecks; 10 coppecks, each of which is equal to two moscosques, make a grive, and 100 coppecks, or 10 grives, is a rouble. In the kingdom of Sweden, accounts are kept in dollars, marks, and oorts, the dollar being worth four marks, and the mark eight oorts. In Denmark, accounts are kept in marks and schellings; the rixdollar is worth six marks; the mark, 16 schellings; and the schelling, three penins. Accounts are kept at Bergen, and in other places in Norway, in Danish rixdollars, marks, and schellings.

In Poland, accounts are kept in guilders, gros, and deniers, of which 18 deniers make a gros, and thirty gros a guilder: they here keep accounts also in rixdollars and gros, reckoning 90 of the latter to one of the former. At Riga accounts are kept in rixdollars and gros, the former of which species consists of 90 of the latter.

Turkish MONEY of Account. The Turks, both in Europe, Asia, and Africa, account by purses, either of silver or gold, the last being only used in the seraglio, with half purses of gold, called also rizes: the purse of silver is equal to 1500 French livres, or about 63l. sterling; and the half purse in proportion: the purse of gold is 15000 sequins, equal to 30000 French crowns, or about 3750l. sterling: this is seldom used but for presents to favourites, so that a purse simply signifies a purse of silver, or 1500 livres. The merchants also use Dutch dollars, called altani or abouquels, with medins and aspers: the dollar is equal to 35 medins, and the medin to three aspers; the asper to a halfpenny sterling money.

Asiatic MONIES of Account are as follow. In Persia they account by the taman, called also man and tumein, and dinar-basti; the taman is composed of 50 abassis, or 100 mamodies, or 200 chapes, or 10000 dinars; which, accounting the abassi on the foot of 18 French sols, or the dinar on that of a denier, amounts to 3l. 12s. 6d. sterling the taman. They also account by larins, especially at Ormus, and on the coast of the Persian gulph: the larin is equivalent to 11d. sterling; and on that footing is used also in Arabia, and through a great part of the East-Indes.

Chinese MONIES of Account are the pic, picol, and tael; which, though in effect weights, do likewise serve as money of account, obtaining in Tonquin as well as China: the pic is divided into 100 catis, some say 125: the cati into 16 taels, each tael equal to one ounce two drachms: the picol contains 66 $\frac{1}{2}$ caties; the tael is equivalent to 6s. 8d. sterling.

Japanese MONIES of Account are the schuites, cockiens, oebans or oubans, and taels: 200 schuites are equal to 500 Dutch pounds, the cockien equal to 10 Low-country pounds, 1000 oebans make 45000 taels.

Mogul MONEY of Account. At Surat, Agra, and the rest of the estates of the Great Mogul, they use lacres, acres, or leeths, implying one hundred thousand; thus a lacre of rupees is 100,000 rupees; the

the lacre being nearly on the footing of the tun in Holland, and the million of France.

MONEYS of Account of other islands and coasts of India. Throughout Malabar, and at Goa, they use tangas, vintins, and pardos-xeraphin; the tanga is of two kinds, viz. of good and bad alloy; hence their custom is to count by good or bad money; the tanga of good alloy is better by one fifth than the bad, so that four tangas good being allowed the pardos-xeraphin, there will be required five of the bad; four vintins good make a tanga likewise good; fifteen barucos, a vintin; a good baruco is equal to a Portuguese ree, a French denier, or one thirtieth of a penny sterling. In the island of Java they use the fonta, sapacou, fardos, and catis: which last money, together with the leeth or laere, is much used throughout all the East-Indies; the fonta is 100 caxas, or little pieces of that country, hung on a string, and is equal to eleven twelfths of a penny sterling; five fontas make the sapacou. The fardos equal to 25. 8d. sterling; the cati contains 20 taels; the tael 6s. 8d. sterling. There are islands, cities, and states of the East-Indies, whose monies of account are not here expressed, partly because reducible to some of the above-mentioned, and partly because we find no certain consistent account of them.

African MONEY of Account. From Cape Verd to the Cape of Good-Hope, all exchanges and valuations of merchandize are made on the foot of the macoute and piece; which, though no monies of account, for those barbarians have no real monies, and therefore need imaginary ones to estimate them by, yet serve in lieu thereof. At Loango de Boirie, and other places on the coast of Angola, the estimations are made by macoutes; and at Malimbo and Cabindo, on the same coast, the negroes reckon by pieces: among the first the macoute is equal to 10 pieces: ten macoutes make one hundred, which likewise gives us a kind of imaginary money to estimate any purchase, exchange, &c. they fix on the one side the number of macoutes required; e. gr. for a negro; so that there are several bargains made for one: suppose, for instance, the slave to be fixed at 3500 pieces, this amounts to 350 macoutes in merchandize, they fix the price of each in macoutes. Two Flemish knives, e. gr. are accounted one macoute; a copper-bason, 2 pounds weight three; a barrel of gunpowder, three, &c. For

the piece it serves in like manner to estimate the value of goods, duties, &c. on either side: thus the natives require ten pieces for a slave; and the Europeans put, for instance, a fusée at one piece, a piece of salampours at four pieces, &c. The cities of Barbary and Egypt, whither the Europeans traffick, reckon much after the same manner as in the Levant, and the dominions of the Grand Signior; for the rest, through that vast extent of coast where we trade for negroes, gold-dust, elephants teeth, wax, leather, &c. either the inhabitants do not know what money of account is, or, if they have any, it is only what strangers, settled among them, have introduced.

MONEYERS, MONEYORS, or MONIERS, officers of the mint, who work and coin gold and silver money, and answer all waste and charges.

MONITORY LETTERS, letters of warning and admonition, from an ecclesiastical judge, upon information of scandals and abuses, within the cognizance of his court.

MONK, a man who wholly dedicates himself to the service of religion, in some monastery, under the direction of some particular statutes and rules. The most probable account of the original of the monks is, that in the Decian persecution, in the middle of the third century, many persons in Egypt, to avoid the fury of the storm, fled to the neighbouring deserts and mountains, where they not only found a safe retreat, but also more time and liberty to exercise themselves in acts of piety and divine contemplations; which sort of life became so agreeable, that when the persecution was over, they refused to return to their habitations again, choosing rather to continue in those cottages and cells; which they had made for themselves in the wilderness. From that time to the reign of Constantine, monachism was confined to the hermits, or anachorets, who lived in private cells in the wilderness; but when Pachomius had erected monasteries, other countries presently followed the example.

MONKEY, *Simia*, in zoology, a numerous genus of quadrupeds of the order of the anthropomorpha, or quadrupeds that resemble the human figure: their face is naked; the claws are rounded and flattish, in some degree like the nails on the human hand; and they have both an upper and lower eye-lid. Of all the animals of the monkey-kind, the satyr resembles mankind most; its face is

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naked, and is very like that of an aged man; it has no tail, and in other respects greatly resembles the human form. The most like, next to this, is the oran-outang, or black faced monkey, called the savage; and the next to this is the baboon, or whiskered-simian, with a short tail: the rest of the monkeys, of which there are a great many kinds, differing widely both in size and figure, have nevertheless something of the human aspect; and as they are tractable animals, people make them walk erect with a staff; and perform many tricks, to shew their resemblance; but, in general, such monkeys as have no tails, have more of this likeness than those which have.

* **MONMOUTH**, the capital town of Monmouthshire, a very ancient place, and at this day very considerable. It had a stately castle, wherein Henry V. who conquered France, was born, but it is now gone to ruin. It is governed by two bailiffs, fifteen common council, and a town clerk. It has a market on Saturdays, and three fairs on Whitsunday, and September 4; for horned cattle, and on November 22, for horned cattle, fat hogs, and cheese. It was formerly walled round, but now there is little remaining, except three gates. It consists of two parishes. It is seated on the river Wye, over which is a stone bridge of two arches, beyond which there is a suburb half a mile long. It sends one member to parliament, and is twenty-five miles west of Gloucester, and one hundred and twenty-nine west of London. Long. 2. 30. W. Lat. 51. 47. N.

* **MONMOUTHSHIRE**, a county, in the diocese of Landaff, formerly a Welch county, it being on the borders of Wales. It is bounded on the north-east by Herefordshire, on the south-east by the Severn, which parts it from Gloucestershire and Somersetshire, and on the west by Brecknock and Glamorganshire. It is thirty-three miles in length, and twenty-two in breadth. It is a pretty plentiful country, for it not only has a competency for its inhabitants but sends supplies to its neighbouring counties. The east part abounds with pastures and woods, but the west parts is mountainous and rocky. Its principal rivers are the Rimney, the Ebwitt, the Usk, and the Wye. There are one hundred and twenty-seven parish churches in the county, and it sends three members to parliament, two for the county and one for Monmouth.

MONOCHORD, a musical instru-

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ment, composed of one string, used to try the variety and proportion of sounds.

MONOECIA, in botany, one of Linnaeus's classes of plants, the twenty-first in order; in which the male and female flowers are placed separately on the same plant, or rather on different stalks growing from the same root.

Of the plants belonging to this class, some have only one stamen, and others have three, four, five, six, or more stamina; whence the subordinate orders of monoecia-monandria, monoecia-triandria, &c. others again are monadelphous, others syngenesious, and others gynandrous.

MONOPE TALOUS, in botany, is applied to flowers that have only one undivided leaf.

MONOPOLY, in commerce, denotes when a person makes himself sole master of a commodity, manufacture, &c. in order to enhance the price thereof. There are two kinds of monopoly, when a person buys up corn, &c. to retail it again at an advanced price; or when a patent is procured, prohibiting any other person to sell a certain commodity but the patentee.

MONOPTERE, in architecture, a kind of temple, round, and without walls, having a dome supported by columns.

MONOPTOTON, in grammar, a noun that has only one case, as *infic. as*.

MONOS ICH, an epigram that consists of only one single verse.

MONOSYLLABLE, in grammar, a word that consists of only one syllable, and is composed of either one or more letters pronounced at the same time.

MONOTONY, an uniformity of sound, or a fault in pronunciation, when a long series of words are delivered in one unvaried tone.

MONSOON, in physiology, a species of trade-wind, in the East Indies, which for six months blows constantly the same way, and the contrary way the other six months.

* **MONTGOMERY**, the capital of Montgomeryshire, in Wales, with a market on Thursdays, and four fairs, on March 26, June 7, September 4, and November 14, for sheep, horned cattle, and horses. It is an ancient town, seated very agreeably on a rocky eminence, near rich meadows. It sends one member to parliament, who is elected by joint consent of several towns. This town was first built by Roger de Montgomery, earl of Shrewbury, from whom it took its name. It was once a place of good strength, was surrounded

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surrounded with a wall, and fortified with a strong castle, which was demolished in the civil wars; and the town itself does not now consist of above a hundred houses. It is seventy miles north-east-by-east of Gloucester, and one hundred and sixty-one west-by-west from London. Long. 3. 10. W. Lat. 52. 36. N.

* **MONTGOMERYSHIRE**, a county of North Wales, thirty-five miles in length, and thirty-four in breadth. It is bounded on the north by Merionethshire and Denbighshire; on the east by Shropshire; on the south by Radnor and Cardiganshire; and on the west by part of Merionethshire. It contains sixty-eight parishes, and six market-towns. It sends but two members to parliament, viz. one for the county, and the other for Montgomery. It is watered by several small streams, which run into the Severa, whose head is at a small lake on the top of Plinlimon-hill, and the rivers Rhydel and Wye have their sources on the same mountain. This county is full of high hills, with a few valleys and meadows fit for corn and pastures. The air is sharp and cold, on account of the mountains; but in the valleys it is more mild. Montgomery is the capital town.

MONTH, *Mensis*, in chronology, the twelfth part of a year. See *Year*.

Time being duration, marked out for certain uses, and measured by the motion of the heavenly bodies, there thence results divers kinds of months as well as years, different from one another, according to the particular luminary by whose revolution they are determined, and the particular purposes they are destined for; hence months are of two kinds, astronomical and civil. An astronomical month is that which is governed either by the motion of the sun or moon, and is consequently of two kinds, solar and lunar: a solar month is that time in which the sun seems to run through a whole sign, or the twelfth part of the ecliptic. Hence, if regard be had to the sun's true apparent motion, the solar month will be unequal, since the sun is longer in passing through the winter-signs than through those of the summer; but as he constantly travels through all the twelve signs in 365 days, 5 hours, and 49 minutes, the quantity of a mean month will be had, by dividing that number by 12; on this principle the quantity of a solar month will be found to be 30 days, 10 hours, 29 minutes, 5 seconds. See *Earth*.

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A lunar month is that space of time which the moon takes up in performing its course through the zodiac, or that measured by the motion of the moon round the earth; and is of three kinds, viz. periodical, synodical, and that of illumination. The lunar periodical month is the space of time wherein the moon makes her round through the zodiac, or wherein she returns to the same point, being 27 days, 7 hours, 43 minutes, 5 seconds. See *Moon*.

The lunar synodical month, called also absolutely the lunar month and lunation, is the space of time between two conjunctions of the moon with the sun; or the time it takes from one conjunction with the sun to the next; or from one new moon to another: the quantity of a synodical month is 29 days, 12 hours, 44 minutes, 3 seconds, and 11 thirds. The quantity of a synodical month is not the same at all times, for in the summer solstice, when the sun seems to move slowest, the synodical month appeareth less, being about 29 days, 6 hours, 42 minutes; but in the winter, when the sun's motion seems faster, the moon does not fetch up the sun so soon, for which reason the synodical month then seems greater, viz. 29 days, 19 hours, and 37 minutes, according to the observation of the same astronomers: so that the first quantity of the synodical month is to be understood as to the mean motion. From what has been said, it may easily appear that the difference between a periodical and synodical month is this: the first is called periodical in respect of the moon's orbit: but the synodical is so called in respect of its connection with the other luminary. Now after the time of its conjunction, the sun does not continue in the same place of the zodiac, but moves forwards towards the east; upon which it falls out that the moon, finishing its course, does not find the sun again in the same place where it left him, he being removed almost a whole sign from his former place; so that to overtake the sun again, it plainly appears that a certain space of time is requisite besides the periodical, which makes up the synodical month.

The ancient Romans made use of the lunar months, and made them alternately of 29 and 30 days; and they marked the days of each month by three terms, viz. calends, nones, and ides.

The lunar month of illumination, or apposition, or illuminative month, is the space

space from the first time of the moon's appearance after new moon, to her first appearance after the new moon following. The lunar month of illumination is not of any determined quantity, because the moon appears sometimes sooner, and sometimes later, after the conjunction; for which diversity astronomers give us several reasons, particularly the obliquity of the zodiac, the variable latitude of the moon, the apparent inequality of its motion, the different qualities of the summer and winter air, &c. By this month, however, the Turks and Arabs go; and it is said that the ancient Britons went by the phases of the moon.

A civil or political month consists of a certain number of days, according to the laws and customs of the different countries wherein it is used, either having no regard to the solar or lunar months, as those of the Egyptians in their equal year, of the Romans in the year of Romulus, &c. or coming pretty near to the solar astronomical month, as the Julian; or else the lunar astronomical, as the Jewish, Turkish, and others. The British and most European nations make twelve months in the year, viz. January, February, &c. See the articles *January*, &c.

Civil solar months are such civil months as are accommodated to the astronomical months, or those which are to consist alternately of 30 and 31 days, excepting one month of the twelve, which, for every fourth year, consisted of 30 days, and for the other years of 29. This form of civil months was introduced by Julius Cæsar; but under Augustus the sixth month, till then, from its place, called Sextilis, was denominated Augustus, in honour of that prince; and to make the compliment yet the greater, a day was added to it, so that it now consists of 31 days, though till then it had only 30; to make up for which, a day was taken from February, so that from thenceforward it only consisted of 28 days, and every fourth year of 29; though before it had ordinarily consisted of 29 days, &c. and such are the civil or calendar months which now obtain throughout Europe.

Civil lunar months are to consist alternately of 29 and 30 days: thus will two civil months be equal to two astronomical ones, abating for the odd minutes, and consequently the new moon will be hereby kept to the first day of each such civil month, for a long time together. However, to make them keep constantly pace with the civil months, at the end of each

948 months, a month of 29 days must be added, or else every 33d month must consist of 30 days. This was the month in civil or common use among the Jews, Greeks, and Romans, till the time of Julius Cæsar.

* MONT-REAL, an island of North America, in the river St. Lawrence, about twenty-eight miles in length, and ten in breadth. The soil is fertile, and the air wholesome: it belonged to the French; but was taken by the generals Amherst and Murray, the 8th of September, 1760, without firing a gun: according to the terms of capitulation, all the French forces were to be sent to Old France; and, consequently, all Canada became subject to Great Britain. The town is pretty well fortified, and has a pleasant situation, with wide open streets. The Hotel-Dieu, the magazines, and the place of arms, are in the Lower Town; which is also the residence of the merchants. The seminary or school, the parish church, the monks called Recollets, the Jesuits, and the nuns, are in the Upper. Likewise the late governor, and most of the officers resided in this last. The inhabitants have carried on a trade with the savages in skins and furs. It is one hundred and twenty miles south-west of Québec, one hundred and forty north-by-east of lake Ontario, and one hundred and ten north of Albany. Long. 75. 12. W. Lat. 46. 10. N.

MONUMENT, in architecture, a building destined to preserve the memory, &c. of the person who raised it, or for whom it was raised; such are a triumphal arch, a mausoleum, a pyramid, &c.

MONYCHA, among naturalists, an appellation given to animals with single or undivided hoofs.

MOOD, or MODE, in logic, called also syllogistic mood, a proper disposition of the several propositions of a syllogism, in respect of quantity and quality.

The direct mood is that wherein the conclusion is drawn from the premises directly and immediately, as, "Every animal is a living thing, every man is a living animal; therefore, every man is a living thing." There are fourteen of these direct moods, four of which belong to the first figure, four to the second, and six to the third.

The indirect mood is that wherein the conclusion is not inferred immediately from the premises, but follows from them by means of a conversion; as, "Every animal is a living thing, every man is an animal;

animal; therefore some living thing is a man."

MOOD, or MODE, in grammar, the different manner of conjugating verbs, serving to denote the different affections of the mind. *See Verb.*

Hence arise four moods, viz. the indicative, subjunctive, imperative, and infinitive: of those the three first are called finite moods, because they define a certain person and number; but the fourth is called infinite, because in it there is no distinction of either person or number. *See Indicative, &c.*

Some grammarians reckon five moods, viz. the indicative, subjunctive, optative, imperative, and infinitive; and some make six, dividing the optative into potential and optative.

MOON, *Luna*, D , in astronomy, a satellite, or secondary planet, always attendant on our earth. Of the six primary planets, we find but three that are certainly attended with moons, viz. the earth, Jupiter, and Saturn; for though Mr. Short has given an account of a phenomenon that he observed some years ago, which seems extremely like a moon about Venus, yet, as it was never observed before nor since through the best of telescopes, it does not appear to be a moon: however, that the reader may use his own judgment, we refer him to the account given of it in the Philosophical Transactions.

The distance of our moon from the earth is determined by her horizontal parallax, or the angle which the semi-diameter of the earth subtends at the moon, viz. the angle AOC (plate XXXIV. fig. 1.) which is the difference between the true place of the moon's center O , when in the horizon, and the apparent place thereof, as viewed from the surface of the earth at A . The former is known by astronomical tables, the latter by observation: and the quantity of this difference or angle at a mean is $57' 12'' = AOC$.

If therefore we say, As the tangent of $57' 12''$ is to radius, so is $AC = 1$ to $CO = 60, 1$; this will be the mean distance of the moon in semi-diameters of the earth. Therefore, since one semi-diameter of the earth contains 3984 miles, we have $3984 \times 60, 1 = 239318, 3 = CO$ the mean distance of the moon.

The moon's apparent semi-diameter MO measures (at her mean distance) $15' 38'' = 938''$ by the micrometer, which is the quantity of the angle MCO . The earth's diameter therefore is to the moon's

as $3432''$ to $938''$ that is, as 109 to 307 or as 3,63 to 1. Wherefore $\frac{30}{109} \times 7964 = 2192$ miles the moon's diameter.

Therefore the face of the earth, as it appears to the lunarians, is to the face of the moon, as it appears to us, as 109×109 to 30×30 , viz. as 11881 to 900, or as 13,2 to 1. And the real bulk of the earth is to that of the moon as $109 \times 109 \times 109$ to $30 \times 30 \times 30$, viz. as 1295029 to 27000, that is, as 1295 to 27, that is, as 1295 to 27, or as 48 to 1 very nearly.

Sir Isaac Newton mentions the atmosphere about the moon, but other astronomers think there is reason (not to say a demonstration) for the contrary: for, were there an atmosphere of air like ours, it must necessarily obscure the fixed stars in the moon's appulse to them; but it has been observed that this never happens; on the contrary, they preserve all their splendor to the moment of their occultation, and then disappear instantaneously, and in the same manner they recover their light, when they appear again on the other side. And this I am very certain of from a remarkable occultation of Jupiter, which I observed with a good reflecting telescope from the beginning to the end with all the attention possible, because I was very desirous to be satisfied about that matter; and all the phenomena conspired to convince me, there was nothing like an atmosphere about the moon.

That the surface of the moon is not smooth or even, - but diversified with hills and vales, continents and seas, lakes, &c. any one would imagine who views her face through a large telescope.

The time which the moon takes up in making one revolution about the earth, from a fixed star to the same again, is 27 d. 7 h. 43', which is called the periodical month. But the time that passes between two conjunctions, that is, from one new moon to another, is equal to 29 d. 12 h. 44' 3'', which is called a synodical month: for, after one revolution is finished, the moon has a small arch to describe to get between the sun and the earth, because the sun keeps advancing forwards in the ecliptic. Now this surplus of motion takes up 2 d. 5 h. 1' 3'', which added to the periodical month makes the synodical, according to the mean motions.

The moon moves about its own axis in the same time that it moves about the earth,

earth, from whence it comes to pass that she always shews the same face to us : for by this motion about her axis just so much of her surface is turned towards us constantly, as by her motion about the earth would be turned from us.

But since this motion about the axis is equable and uniform, and that about the earth, or common center of gravity, is unequal and irregular, as being performed in an ellipsis, it must follow, that the same part of the moon's surface precisely can never be shewn constantly to the earth; and this is confirmed by the telescope, through which we often observe a little gore or segment on the eastern and western limb appear and disappear by turns, as if her body librated to and fro; which therefore occasioned this phenomenon to be called the moon's libration.

The orbit of the moon is elliptical, more so than any of the planets, and is perpetually changing or variable, both in respect of its figure and situation; of which we shall treat more largely further on. The inclination of the moon's orbit to the plane of the ecliptic is also variable, from 5 degrees to 5° 18'. The line of nodes likewise has a variable motion from east to west, contrary to the order of the signs, and completes an entire revolution in a space of time a little less than nineteen years. Also the line of the apsidal, or of the apogee and perigee, has a direct motion from west to east, and finishes a revolution in the space of about nine years.

The phases of the moon in every part of the orbit are easily accounted for from her different situation with respect to the earth and sun: for though to an eye placed in the sun she will always exhibit a complete illuminated hemisphere, yet in respect to the earth, where that hemisphere is viewed in all degrees of obliquity, it will appear in every degree from the greatest to the least.

As the moon illuminates the earth by a reflex light, so does the earth the moon; but the other phenomena will be different for the most part. We shall insert them for the reader's curiosity as follows. (1.) The earth will appear but to little more than one half of the lunar inhabitants. (2.) To those to whom the earth is visible, it appears fixed, or at least to have no circular motion, but only that which results from the moon's libration. (3.) Those who live in the middle of the moon's visible hemisphere see the earth directly over their heads. (4.) To those

who live in the extremity of that hemisphere the earth seems always nearly in the horizon, but not exactly there, by reason of the libration. (5.) The earth in the course of a month would have all the same phases as the moon has. Thus the lunarians, when the moon is at E (fig. 9.) in the middle of their night, see the earth at full, or shining with a full face; at G it is dichotomised, or half light and half dark; at A it is wholly dark, or new; and at the parts between these it is gibbous. (6.) The earth appears variegated with spots of different magnitudes and colours, arising from the continents, islands, oceans, seas, clouds, &c. (7.) These spots will appear constantly revolving about the earth's axis, by which the lunarians will determine the earth's diurnal rotation, in the same manner as we do that of the sun.

To find the Age, or Change of the MOON.

Janus 0, 2, 1, 2, 3, 4, 5, 6,
8, 8, 10, 10, these to the epact fix,
The sum, bate 30, to the month's day add,
Or take from 30, age, or change, is had.

EXAMPLE. March 10, 1752.

Ep.=14

1=N° of the month.

15

10=day of the month.

25 days=moon's age.

30

15

15 March = change.

To find the Time of the MOON's coming to the South, and of High-Water at London-Bridge.

Four times the moon's age, if by 5 you divide,

Gives the hour of her southing; add 2 for the tide.

EXAMPLE. Moon's age=9 days.

4

5)36(7 H.

1

12 M.=3 H.

7 H. 12 M. p. m.=southing.

2

9 12=high water.

To find the Time of the MOON's beginning

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to find.—Multiply her age, if under 15, by 48, and divide the product by 60; the quotient gives the hour, and the remainder the minute. If her age be above 15 days, subtract the time thus found from 24; the remainder gives the time of shining in the morning.

MOOR, in country affairs, an unlimited tract of land, usually over-run with heath.

MOOR-BUZZARD, the English name of the yellow legged falcon, with an iron-coloured body and yellow head. It is about the size of a common crow.

MOOR-COCK, or **GOR-COCK**, a species of tetrao, with a forked tail, spotted, with white underneath. It is a native of England, but very rare; the male is throughout of a very deep iron-grey, without any variegation; and the female is also grey, but variegated with transverse lines of black.

MOOR-HEN, the English name of the gallinula or tringa. See *Tringa*.

MOORING, in the marine, the act of fastening a ship by two or more cables, in a road, haven, or river. A ship may be either moored in a harbour, head and stern; that is, fastened at both ends with cables, reaching from the fore and hind-parts, or with two cables from one end, viz. one from each bow; or she may be secured by moorings, which always remain sunk in the bottom for that purpose.

Moorings are composed of anchors, chains, and bridles. The anchors formed for this purpose have only one flook, and are sunk on the two sides of the river with a strong chain fastened to each of them, which reaches across the stream. In the middle of this chain is fixed a swivel or large link, which turns round in the chain as the ship swings with the tide; and to this link the bridles are fastened. The bridles are short pieces of cable, whose upper ends are drawn into the ship at the mooring ports, and afterwards fastened to the masts.

MOOR-STONE, a valuable stone much used in the coarser works of the present builders; being truly a white granite, of a marbly texture.

MOOT, a difficult case urged by the young barristers and students at the inns of court, by way of exercise, the better to qualify them for practice, and to defend the causes of their clients. This, which is called *mooting*, is the chief exercise of the inns of court. Particular times are appointed for the arguing moot-cases: the place where this exercise is performed, was anciently called *Moot-Place*. III.

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hall; and there is a bailiff, or surveyor of the moots annually chosen by the bench, to appoint the moot-men for the inns of Chancery, and to keep an account of the performance of exercises.

MORAL, belonging to manners, or the conduct of life.

MORAL PHILOSOPHY, the same with ethics. See *Ethics*.

MORAL SENSE, that whereby we perceive what is good, virtuous, and beautiful in actions, manners, and characters.

MORALITY, the science and doctrine of morals, otherwise called ethics. See *Ethics*.

Morality may be defined to be the relation, conformity, or agreement of men's voluntary actions to a rule, to which they are referred, and by which they are judged of. These moral rules seem to be of three sorts, with their different enforcements. 1. The divine, whether known by the light of nature or the voice of revelation, which is the only true touch-stone of moral rectitude, the consciences of men bearing witness either of the goodness or sinfulness of their actions; that is, whether as duties or sins they are like to procure them happiness, or misery, from the hands of the Almighty. 2. The civil law, which is the rule set by the commonwealth to the actions of those that belong to it: this rule no body overlooks, the rewards and punishments being ready at hand to enforce it, extending to the protecting or taking away of the life, liberty, and estate of those who observe and disobey it. 3. The law of opinion and reputation, whereby virtue and praise, vice and blame, are ever found to accompany each other: now those who do not think commendation and disgrace sufficient motives to engage mankind to accommodate themselves to the opinions and rules of those with whom they converse, seem little skilled in the history of mankind, since most people govern themselves chiefly by this law of fashion. See *Relation*.

Moral philosophy contemplates human nature, its moral powers and connections, and from these deduces the laws of action; though it must be confessed, that different philosophers have established different systems concerning the foundation of morality, which the reader will find under the article *Ethics*.

According to Mr. Locke, the idea of a Supreme Being, infinite in power, goodness, and wisdom, whose workmanship we are, and on whom we depend, and

the idea of ourselves, as intelligent creatures, would, if duly considered, afford such foundations of our duty and rules of action, as might place morality among the sciences capable of demonstration.

As to the reasons why the mathematical sciences have been thought more capable of demonstration than the ideas of good and evil, right and wrong, &c. they are these. 1. That the former can be represented by sensible marks, as diagrams, which have a nearer correspondence with them than any words. 2. Moral ideas are commonly more complex than those of figures; whence it happens, that their names are of more uncertain signification; and besides, the mind cannot easily retain these precise combinations so perfectly, as is necessary in the examination of the agreements and disagreements of several of them one with another. See *Knowledge*.

One part of these disadvantages in moral ideas, continues the same great author, may in a good measure be remedied by accurate definitions, setting down that collection of simple ideas which every term shall stand for, and then using the term steadily for that precise collection. See *Definition*.

MORASS, a low, moist land, which receives the waters from the higher grounds, without having any descent to carry them off.

MORATUR, or **DEMORATUR**, in law, he demurs; a term used when one of the parties in a cause demurs, and does not proceed in pleading, but rests upon the judgment of the court in some particular point, either in relation to the sufficiency of the declaration, or the pleas of the contrary party; upon which the court, after taking some time to argue and advise, determine the point.

MORBID, among physicians, signifies diseased or corrupt, a term applied either to an unsound constitution, or to those parts or humours that are infected by a disease.

* **MORE** (Sir THOMAS) lord chancellor of England in the reign of King Henry VIII. was the only son of Sir John More, knight, one of the justices of the king's bench, and was born in 1480. He was educated at Oxford, whence he removed to New Inn for the study of the law, and thence to Lincoln's Inn, where he continued his studies and became a barrister. After this he for some time read a public lecture upon St. Augustin *De Civitate Dei*, in St. Lawrence's church

in the Old Jewry. He was a Burgess in parliament in 1501. At length his ingenuity being known to King Henry VIII. he was made master of the requests; knighted and appointed one of the privy-council. In 1520 he was made treasurer of the exchequer, and the next year speaker of the house of commons. In 1528 chancellor of the duchy of Lancaster, and was admitted into the highest degree of favour with the king. He was twice ambassador, being once joined in commission with cardinal Wolsey to the emperor Charles V. and the other time sent to the king of France. Upon the removal of Wolsey in 1530 he had the great seal of England delivered to him, and was declared lord high chancellor, in which office he acted with the greatest integrity and universal approbation. He was averse to the king's divorce from queen Catharine, and to his marriage with Anne Boleyn, and resigned the great seal the 15th of May, 1533, when he retired to his house at Chelsea, where he enjoyed a studious retirement, till at last falling under the king's displeasure, several accusations were laid against him, of which he cleared himself; but upon his refusing to take the oath of the king's supremacy, he was committed prisoner to the Tower of London, condemned for high treason, and beheaded on Tower-hill, the sixth of July, 1535. As he was going up the scaffold, which seemed to him so weak that it was ready to fall, he said merrily to the lord-lieutenant of the Tower, "I pray you, Mr. lieutenant, see me safe up, and for my coming down let me shift for myself;" and upon laying his head on the block, he bid the executioner stay till he had removed his beard, observing that it had never committed any treason. This truly great and good man wrote several works.

MORESKE, or **MORISCO**, is a kind of painting, carving, &c. done after the manner of the Moors; consisting of several grotesque pieces and compartments, promiscuously mingled, not containing any perfect figure of a man, or other animal; but a wild resemblance of birds, beasts, trees, &c.

MORNING, the beginning of the day, the first appearance of light, or the time from midnight till noon.

MOROCCO, *Marroquin*, in commerce, a fine kind of leather, prepared of the skin of an animal of the goat kind, and imported from the Levant, Barbary, &c.

Manner of preparing Red MOROCCO.—
After

After sleeping, stretching, scraping, beating, and rinsing, the skins are at length wrung, stretched on the leg, and passed after each other into water where alum has been dissolved. Thus alumed, they are left to drain till morning, then wrung out, pulled on the leg, and folded from head to tail, the flesh inwards. In this state they receive their first dye, by passing them after one another into a red liquor, prepared with laque, and some other ingredients, which the marroquineers keep a secret. This they repeat again and again, till the skins have got their first colour; then they are rinsed in clear water, stretched on the leg, and left to drain twelve hours; thrown into water, into which white galls pulverized have been past through a sieve, and stirred incessantly for a day with long poles; taken out, hung on a bar across the water all night, white against red, and red against white, and in the morning the water stirred up, and the skins returned into it for twenty-four hours.

* MOROCCO, empire of, a country in Africa, bounded by the streights of Gibraltar and the Mediterranean sea on the north; by the river Mulvia on the east; by Biledulgerid on the south; and by the Atlantic ocean on the west. It is divided into three parts, Fez, Morocco Proper, and Suz, besides the kingdom of Taflet and the province of Gessula. The chief towns of the first are Fez and Mequinez; of the second, Morocco; and of the third Taradant. The capes of the most note are Cape Spartel, at the entrance of the streights of Gibraltar, and Cape Cantin, in the ocean. The great mountains, called Mount Atlas, which runs the whole length of Barbary, from east to west passes through Morocco as far as the sea, which upon this account is called the Atlantic ocean. The chief rivers are the Mulvia, the Sus, the Ommirabi, the Tensif, and the Guedet: of these rivers the Mulvia only is navigable, and the mouth of that is almost choaked up with sand. The air of this country is temperate, it being refreshed by breezes in the hottest season, and they have very little winter. Fez is the capital city, and the emperor has a palace there, though he chiefly resides at Mequinez. The soil is exceeding good, and capable of producing vast quantities of corn, wine, and oil. The plains of Fez and Morocco are well planted with olives, and there are no better grapes in the world. The plains produce excellent hemp and flax; but as

for timber trees they have very few. The animals are the same as in other parts of Africa, except the elephant and rhinoceros, which never ramble so far to the north. However, they have camels, which are not to be met with in the south, and a breed of horses called barbs, the finest in the world. They carry on a trade, by land, to Arabia and Negroland, with very fine woollen manufactures, Morocco leather, indigo, cochineal, and ostrich feathers; and bring back silks, muslins; and drugs. The caravans to Negroland carry salt, silk, and woollen manufactures, and bring back gold, ivory, and Negroe slaves. With regard to their religion, it is the same as in other Mahometan countries, and needs not be particularly mentioned here. Their punishment of criminals is by impaling them alive, or dragging them along the streets till their flesh is torn off, or throwing them on iron hooks, where they hang till they die. They have but few ships, for which reason the Europeans bring them linen and woollen cloth, stuffs, iron, wrought and unwrought, arms, gunpowder, and lead, for which they carry back copper, wax, Morocco leather, very fine wool, gums, soap, dates, almonds, and other fruits.

* MORPHEUS, in fabulous history, the god of sleep, or as some say, one of the ministers of Somnus. He caused sleepiness, and represented the forms of dreams. Ovid gives him the appellation of the kindest of deities. He is usually represented in a recumbent posture, and crowned with poppies.

MORPHEW, a leprous kind of scurf, which sometimes breaks out upon the skin, particularly about the forehead.

MORSE, in zoology, a name by which some call the hippopotamus.

MORTALITY, or *Bills of Mortality*, properly denote weekly lists of the persons who die in any place. In London, these bills are drawn up by the company of parish-clerks, and contain an account of the numbers, ages, diseases, &c. of such as die within the bills of mortality; that is, in London, Westminster, and ten miles round. The great disparity between the births and burials in London, is owing to this, that the dissenters of all sorts baptize their children without sending an account of them to the parish clerks, and persons are continually coming up from all parts, to the metropolis; so that little dependance is to

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be had on these, with regard to calculating annuities for life.

MORTAR, a preparation of lime and sand mixed up with water, which serves as a cement, and is used by masons and brick-layers in building of walls of stone and brick. Besides the common mortar used in laying stones, bricks, &c. there are several other kinds; as, 1. white mortar, used in plaistering walls and ciellings, which are often first plaistered with loam, and is made of ox or cow-hair mixed and tempered with lime and water without any sand. The common allowance is one bushel of hair to six of lime; the hair binds the mortar, holds it fast together, and keeps it from cracking. 2. Mortar for furnaces, &c. is made with red clay wrought in water in which horse-dung and chimney-foot has been steeped, by which a salt is communicated to the water, which binds the clay and makes it fit to endure the fire: this clay ought not to be too fat, lest it should be subject to crack; nor too lean or sandy, lest it should not bind enough. 3. Some workmen in metals, use a kind of mortar to plaister over the inside of the vessels in which they refine their metals, to keep them from running out: this kind of mortar is made with quick-lime and ox-blood, the lime being first beaten to powder and sifted, and afterwards mixed with the blood. 4. Mortar for sun-dials on walls, may be made of lime and sand tempered with linseed oil, or for want of the latter, with skimmed milk; but oil is better. This spread upon the wall will become as hard as stone, and will endure the weather six times as long as the ordinary plaister made of lime and hair with water. 5. For plaistering the fronts of houses in imitation of brick-work, some use a mortar made of sharp sand and lime, powder of brick, and some red ochree: and timber-houses, plaistered over with this kind of mortar, look well, though they have been done twenty or thirty years. 6. The mortar used in Italy for making water courses and cisterns, and also in finishing or plaistering of fronts is of two sorts: the one is composed of lime and hogs-grease, mixed with the juice of figs; and the other is of the same ingredients, but has liquid pitch added to the rest, and is first wet or slaked with wine, and then pounded or beaten with hog's grease and juice of figs. 7. An extraordinary good mortar for floors, walls, ciellings, &c. may be made with ox-blood and fine clay

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tempered together. 8. And in buildings, one part of waste soap-ashes, mixed with another of lime and sand, make a very durable mortar.

MORTAR-PIECE, a short piece of ordnance, considerably thick and wide, serving to throw bombs, carcasses, fire-pots, &c. The use of mortars is thought to be older than that of cannon; they being employed in the wars in Italy to throw stones and balls of red-hot iron, long before the invention of bombs; which, as Blondel informs us, were first thrown at the siege of Wachtendonk, in Guelderland, in 1588. It was formerly the opinion of gunners, that only one certain charge of powder was requisite for each mortar, and that the horizontal range could not be altered but by changing the direction of the piece; but, at present, when a place lying in the same horizontal plane with the mortar, is to be bombarded, they elevate the piece to 45° , and augment or diminish the charge of powder until they can hit the mark. The following advantages introduced this practice: 1. The public powder is saved as much as possible; because, at a direction of 45° , a less velocity, and consequently a less charge of powder is required to make any horizontal range, than is necessary to make the same horizontal range at any other elevation. 2. In elevating mortars to their proper directions, gunners seldom come within a degree or two of the proposed elevation, both on account of the imperfection of the instruments which they generally use for that purpose, and the hurry they are in at that time. And in bombarding towns from ships, it is scarce possible to come within two degrees of the designed elevation, because of the agitation of the vessel, which continually changes the direction of the mortar. But by raising the mortar to 45° , the bad consequences of this inaccuracy of elevation are in a great measure prevented, because a small error above or below 45° , occasions a very inconsiderable error of amplitude. For the same reasons, also, places lying above or below the horizontal plane, passing through the piece, are bombarded by directing the mortar so as its axis may bisect the angle comprehended between a perpendicular to the horizon, at the point of projection, and a line drawn from that point to the mark aimed at; and then augmenting and diminishing the charge of powder until the object be hit. When the business, therefore, can be effectually done

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done by this middle elevation, it ought certainly to be preferred to any other. In shooting with mortars, the following general rules should be always observed, 1. To measure the distance of the object aimed at. 2. That the bombs be of equal weight, otherwise the shots will vary. 3. That the carriage be on an exact level, to prevent its leaping. 4. That the powder with which the piece is charged, be always of the same strength and quantity. 5. That the charge be always equally rammed down. 6. That the wads be always of wood, tampions, or oakum. 7. That the fuses be fresh made the days on which they are to be used; and that they be of a composition proportionable to the range of the shot in the air, so that the bomb may break at the very moment of, or soon after, its fall; which composition must be such as not to be extinguished though it falls in water, but continue burning till the bomb breaks. See BOMB.

MORTGAGE, in law, a pledge or pawn of lands, tenements, &c. for money borrowed; so called because if the money is not paid at the day, the land dies to the debtor, and is forfeited to the creditor. The common method of making a mortgage, is by lease for a long term of years, wherein a pepper-corn rent has been usually reserved; or it may be made by assignment for a term, and by lease and release. The creditor, who holds the estate according to the condition of the deed, is called the mortgagee; but the mortgager, who is the person that makes the mortgage, generally keeps possession of the land till failure is made in the payment of the mortgage money; in which case, though the mortgagee enters for non-payment, the mortgager has a right to the equity of redemption in the court of chancery, where he may call the mortgagee to an account for the profits of the land mortgaged. By a late statute it is ordained, that when any action of ejectment is brought by a mortgagee, for the recovery of the possession of the lands or tenements, &c. mortgaged, and there is no suit in equity for foreclosing or redeeming the equity of redemption, in case the person intitled to redeem shall, *pendente lite*, or pending the action, bring all the principal and interest due, with costs, into court, it shall be taken as a full satisfaction and discharge of the mortgage, and the mortgagee shall thereon be obliged to reconvey the land, &c. and deliver up all deeds, &c. 7 Geo. II. c. 201.

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MORTIFICATION, in medicine, the same with sphacelus. See SPHACELUS.

MORTISE, or **MORTOISE**, in carpentry, &c. a kind of joint, wherein a hole of a certain depth is made in a piece of timber, which is to receive another piece called a tenon.

MORTMAIN, in law, the alienation of lands or tenements to any religious house, corporation, or fraternity, and their successors. Lands alienated in mortmain are different from others, for they never revert to the donor, or to any temporal or common use; on which accounts the lords by such alienation lose their escheats, and many services that were formerly due to them; as bodies politic never die, nor can perform personal service, commit treason, felony, or the like. By the statute of mortmain lately made, it is enacted, that no manors, lands, &c. shall be given or granted to, or settled upon any persons, bodies politic, &c. for any estate whatsoever, or charged in trust for charitable uses, unless it be done by deed indented and sealed twelve months at least before the donor's death, and enrolled in chancery within six months after executed. The two Universities, and the colleges of Eaton, Westminster, &c. are excepted out of this act. 9 Geo. II. c. 35.

MORTUARY, in the ecclesiastical law, a gift left by a man at his death to his parish-church, in recompence of personal tythes omitted to be paid in his life-time: or it is that beast, or other cattle, which, after the death of the owner, by the custom of the place, is due to the parson or vicar, in lieu of tithes or offerings forgot, or not well and truly paid by him that is dead.

MOSAIC, or **MOSAIC-WORK**, an assemblage of little pieces of glass, marble, precious stones, &c. of various colours cut square, and cemented on a ground of stucco, in such a manner as to imitate the colours and degradations of painting. The materials used for these works are little pieces of glass of all the different shades in every tint or colour, like those of the fine English worsted used in needle-work. The glass is first cast into thin cakes, which are afterwards cut into long pieces of a different thickness. Many of the pieces used in the works on roofs and ceilings, which are consequently seen only at a great distance, appear to be a finger's breadth; but the finer works consist only of glass pins, if we may make use of that expression, not thicker than

than a common sewing needle, so that a portrait of four feet square shall take up two millions of such pins or studs. These pins are so closely joined together, that after the piece is polished, which is done in the same manner as looking-glasses are polished, it can hardly be discerned to be an arrangement of an infinite number of particles of glass; but rather looks like a picture painted with the finest colours, with crystal placed before it. The ground in which these vitreous pieces are inlaid, is a paste, compounded of calcined marble, fine sand, gum tragacanth, whites of eggs, and oil. It is at first so soft that the pieces are easily inserted, and upon an oversight, may be taken out again, and the paste new moulded for the admission of other pins or studs; but by degrees it grows as hard as a stone, so that no impression can be made on the work. This paste is spread within a wooden frame, which, for the large pieces, must not be less than a foot in breadth and thickness. This frame is fastened with brass tacks to a plate of the same metal, or to a stone slab; and as in capital pieces, which are often twenty feet by fifteen, this paste-ground must be above three quarters of a foot deep, and the pins or studs as long, it may easily be conceived of what weight such a piece must be. The pieces designed for roofs, or any distant place, are not polished; but in the altar-pieces, &c. nothing is wanting to give them the most beautiful and splendid appearance. A piece of about eighty feet square, if performed with tolerable care and delicacy, will employ eight artists for the space of two years. The studs of the several colours lie ready before the artist in cases, as the letters are laid before the compositors in a printing-house: and such is their accuracy in imitating the finest strokes of the pencil, that the only apparent difference betwixt the original painting and such a copy, is, that the latter has a much finer lustre, and the colours are more vivid.

Method of performing MOSAIC-WORK of Marble and precious Stones.—The ground of mosaic-works wholly marble, is usually a massive marble, either white or black. On this ground the design is cut with a chissel, after it has been first calqued. After it has been cut of a considerable depth, i. e. an inch or more, the cavities are filled up with marble of a proper colour, first fashioned according to the design, and reduced to the thickness of

the indentures with various instruments. To make the pieces thus inserted into the indentures cleave fast, whose several colours are to imitate those of the design, they use a stucco, composed of lime and marble-dust; or a kind of mastic, which is prepared by each workman after a different manner peculiar to himself.

The figures being marked out, the painter or sculptor himself draws with a pencil the colours of the figures, not determined by the ground, and in the same manner makes strokes or hatchings in the place where shadows are to be; and after he has engraven with the chissel all the strokes thus drawn, he fills them up with a black mastic, composed partly of Burgundy-pitch poured on hot; taking off afterwards what is superfluous with a piece of soft stone or brick, which, together with water and beaten cement, takes away the mastic, polishes the marble, and renders the whole so even, that one would imagine it only consisted of one piece.

This is the kind of Mosaic work that is seen in the pompous church of the Invalids at Paris, and the fine chapel at Versailles, with which some entire apartments of that palace are incrustated.

As for Mosaic work of precious stones, other and finer instruments are required than those used in marble, as drills, wheels, &c. used by lapidaries and engravers on stone. As none but the richest marbles and stones enter this work, to make them go the further they are sawn into the thinnest leaves imaginable, scarce exceeding half a line in thickness; the block to be sawn is fastened firmly with cords on the bench, and only raised a little on a piece of wood, one or two inches high. Two iron pins, which are on one side the block, and which serve to fasten it, are put into a vice contrived for the purpose, and with a kind of saw or bow, made of fine brass wire, bent on a piece of spongy wood, together with emery steeped in water; the leaf is gradually fashioned by following the stroke of the design made on paper, and glued on the piece. When there are pieces enough fastened to form an entire flower, or some other part of the design, they are applied to the ground.

The ground which supports this Mosaic work is usually of free-stone. The matter with which the stones are joined together, is a mastic, or kind of stucco, laid very thin on the leaves as they are fashioned;

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fashioned; and this being done, the leaves are applied with plyers.

If any contour, or side of a leaf, be not either squared or rounded sufficiently, so as to fit the place exactly into which it is to be inserted, when it is too large, it is to be brought down with a brass file or rasp; and if it be too little, it is managed with a drill and other instruments used by lapidaries.

Mosaic work of marble is used in large works, as in pavements of churches, basilics, and palaces; and in the incrustation and vaneering of the walls of the same edifices.

As for that of precious stones, it is only used in small works, as ornaments for altar-pieces, tables for rich cabinets, precious stones being so very dear.

* MOSCOW, the duchy of, a province of the western part of the Russian empire, bounded on the north by the province of Twet; on the east by Nise Novogorod; on the south by Rezan; and on the west by Smolensko.

* MOSCOW, a city of the Russian empire, and the capital of the duchy of Moscow. It is divided into four parts, of which that in the middle is called Kitaigorod, and is surrounded with a strong wall of red stone, and contains the royal palace, with the church of the Annunciation, which has a vast vault, wherein are the tombs of the czars. It has nine towers, and is covered with gilded plates of copper, as are all the other churches. It is 460 miles from Petersburg, and 1400 north-east of London.

MOSQUE, a temple, or place of religious worship, among the Mahometans. All mosques are square buildings, generally built with stone: before the chief gate there is a square court, paved with white marble, and low galleries round it, whose roof is supported by marble pillars. In these galleries the Turks wash themselves before they go into the mosque. In each mosque there is a great number of lamps; and between these hang many crystal rings, ostriches eggs, and other curiosities, which, when the lamps are lighted, make a fine shew. As it is not lawful to enter the mosques with shoes or stockings on, the pavements are covered with pieces of stuff sewed together, each being wide enough to hold a row of men kneeling, sitting, or prostrate. The women are not allowed to enter the mosque, but stay in the porches without. About every mosque there are six high

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towers, called minarets, each of which has three little open galleries, one above another: these towers, as well as the mosques, are covered with lead, and adorned with gilding and other ornaments; and from thence, instead of a bell, the people are called to prayer by certain officers appointed for that purpose. Most of the mosques have a kind of hospital belonging to them, in which travellers, of what religion soever, are entertained during three days. Each mosque has also a place called Tarbé, which is the burying-place of its founders; within which is a tomb, six or seven feet long, covered with green velvet or satin, at the ends of which are two tapers, and round it several seats for those who read the koran, and pray for the souls of the deceased.

MOSS, *Muscus*, in botany, a very numerous order of plants, belonging to the cryptogamia class, the fructification of which is but little understood. Mosses are of considerable use in medicine; usnea is esteemed a good desiccative and astringent; the cup-moss is recommended in the chin-cough; the grey ground-lichen, or liverwort, against the bite of a mad dog; and other species, in other disorders, as mentioned under their respective heads. Moss is frequently very injurious to fruit-trees, which grow upon cold barren soils, or where they are so close planted as to exclude the free access of the air; the only remedy, in such cases, is to cut down part of the trees, and to plough up the ground between those left remaining; and in the spring-season, in moist weather, you should, with an iron instrument made a little hollow, the better to surround the branches of the trees, scrape off the moss, carrying it off the place; and by two or three times thus cleansing them, together with carefully stirring the ground, it may be entirely destroyed from the trees; but unless part of the trees are cut down, and the ground be well stirred, the rubbish of the moss will signify little.

If the trees are covered with moss, on account of the dryness of the ground, the proper remedy is to lay mud, from the bottom of a river or pond, pretty thick about their roots.

MOSS is also a name given to boggy grounds in many parts of the kingdom. These consist of a turfy surface, below which is a black, moist, spongy earth, which being dug up with spades somewhat

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what in the form of bricks, and dried, is what they call peats, used as fuel in several parts; and the upper scurf, being cut and dried, makes turfs, another coarser sort of fuel.

MOTH, *Linea*, or *Phalana*, in zoology. See *Phalana*.

MOTION, the continual and successive change of place, and is either absolute or relative.

Absolute MOTION, the change of absolute space or place of bodies, as the flight of a bird, the motion of a projectile, &c.

Relative MOTION, is the change of relative space, or that which has reference to some other bodies; as of two ships under sail, the difference of their velocities is the relative velocity or motion of the ship sailing fastest; and is that alone which is discernible by us. The same is to be understood of absolute and relative rest.

To make this matter plainer, we are to consider that space is nothing else but an absolute and infinite void, which it takes up or possesses; and that place may be considered either absolutely or in itself alone; and then it is called the absolute place of the body; or else with regard to the place of some other body, and then it is called the relative or apparent place of bodies. Now, as a motion is only the change of place in bodies, it is evident that it will come under the same distinction of absolute and relative, or apparent. All motion is in itself absolute, or the change of absolute space; but when the motions of bodies are considered and compared with each other, then they are relative and apparent only: they are relative, as they are compared to each other; and they are apparent only, inasmuch that not their true or absolute motion, but the sum or difference of the motions only is perceptible by us.

In comparing the motions of bodies we may consider them as moving both the same way or towards contrary parts; in the first case the difference of motion is only perceived by us, in the latter the sum of the motions. Thus for example; suppose two ships A and B set sail from the same port upon the same rhumb, and that A sails at the rate of five miles per hour, and B at the rate of three; here the difference of the velocity, viz. (two miles per hour) is that by which the ship A will appear to go

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from the ship B forwards, or the ship B will appear at A to go with the same velocity backwards, to a spectator in either respectively.

If two ships A and B move with the same degree of velocity, then will the difference be nothing, and so neither ship will appear to the other to move at all. Hence it is that, though the earth is continually revolving about its axis, yet as all objects on its surface partake of the same common motion, they appear not to move at all, but are relatively at rest.

If two ships A and B, with the degrees of velocity as above, meet each other, the one will appear to the other to move with the sum of both velocities, viz. at the rate of eight miles per hour; so that in this case the apparent motion exceeds the true, as in the other it fell short of it. Hence the reason why a person, riding against the wind finds the force of it much greater than it really is; whereas if he rides with it, he finds it less.

The reason of all these phenomena of motion will be evident, if we consider we must be absolutely at rest, if we would discern the true or real motion of bodies about us. Thus a person on the strand will observe the ships sailing with their real velocity. A person standing still will experience the true strength and velocity of the wind; and a person placed in the regions between the planets, will view all their true motions, which he cannot otherwise do, because in all other cases the spectator's own motion must be added to, or subtracted from, that of the moving body, and the sum, or difference, is therefore the apparent or relative motion, and not the true.

Motion is also either equable or accelerated.

Equable MOTION is that by which a body passes over equal spaces in equal times.

Accelerated MOTION is that which is continually augmented or increased, as retarded motion is that which continually decreases; and if the increase or decrease of motion be equal in equal times, the motion is then said to be equally accelerated or retarded.

Equable MOTION is generated by a single impetus or stroke; thus the motion of a ball from a cannon is produced by the single action of the powder in the first moment, and therefore the velocity

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it first sets out with would always continue the same, were it void of gravity, and to move in an unresisting medium, which therefore would be always equable, or such as would carry it through the same length of space in every equal part of time.

Hence we may determine the theorems for the expressions of the time, velocity, and the space passed over in equable or uniform motion very easily thus :

Let T and t represent the times of a body moving with the velocities V and v , whereby the spaces S and s are respectively described; then as the space described can only be influenced by the time and velocity, it follows, that $S = T \times V$, and $s = t \times v$; whence $S :: T \times V :: t \times v$; therefore $S \times t \times v = S \times T \times V$: from this general equation, we have $T :: S \times v :: S \times V$, and $V :: S \times t :: S \times T$; that is, the times are as the spaces directly, and the velocities inversely; or in other words, they increase with the spaces, and decrease with the velocities, and the velocities are directly as the spaces, and inversely as the times, and consequently they encrease with the spaces, and decrease with the times.

Accelerated motion is produced by a constant impulse or power, which keeps continually acting upon the body, as that of gravity, which produces the motion of falling bodies; which motion is constantly accelerated, because gravity every moment adds a new impulse, which generates a new degree of velocity; and the velocity thus increasing, the motion must be quickened each moment, or fall faster and faster the lower it falls.

In like manner a body thrown perpendicularly upward; and as a ball from a cannon will have its motion continually retarded, because gravity acts constantly upon it, in a direction contrary to that given by the powder, so that its velocity upwards be continually diminished, and so its motion as continually retarded, till at last it be all destroyed. The body has then attained its utmost height, and is for a moment motionless, after which it begins to descend with a velocity in the same manner accelerated, till it comes to the earth's surface.

The motion generated by an uniformly accelerating force in any given time, is always proportional to that force, it being the genuine and natural effect thereof; and since in all the several parts of time, the force remains the same, and has the same efficacy; therefore the motion generated will also be as the time; whence

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universally the motion generated is in the compound ratio of both the force and the time of acting.

The quantity of motion is as the matter and velocity; therefore the velocity is as the motion directly and the matter reciprocally, and the velocity generated (or destroyed) in any time, is as the force and time directly, and the quantity of matter reciprocally.

The space described from the beginning of the motion generated by an uniform accelerative force, is in the compound ratio of the last velocity, and the time wherein it is generated.

MOTIONS, in war, the marches, counter-marches, &c. of an army in changing its post. See *March*, &c.

MOTTO, in armoury, a short sentence or phrase carried in a scroll, generally under, but sometimes over the arms; sometimes alluding to the bearing, sometimes to the name of the bearer, and sometimes containing whatever pleases the fancy of the deviser.

MOVEABLE, in general, any thing capable of being moved. The moveable feasts are such as are not regularly held on the same day of the year or month, though they are always on the same day of the week. Thus Easter, which is that moveable feast on which all the rest depend, is held on the Sunday which falls upon, or next after, the first full-moon following the twenty-first of March; and all the other feasts keep a regular and certain distance from it; such as Septuagesima, Sexagesima, Ash-Wednesday, Ascension-day, &c. which see under their proper articles.

MOVEMENT, in mechanics, a machine that is moved by clock-work.

MOULD, or **Mold**, in the mechanic arts, &c. a cavity cut with a design to give its form or impression to some softer matter applied therein, of great use in sculpture, foundery, &c.

MOULD, in agriculture, a loose kind of earth, every where obvious on the surface of the ground, called also natural or mother earth; by some also loam. The goodness of a mould for the purposes of gardening, &c. may be known, according to Miller, by the sight, smell, and touch. 1. Those moulds that are of a bright chesnut or hazelly colour, are counted the best: of this colour are the best loams, and also the best natural earth; and this will be the better yet, if it cut like butter, and does not stick obstinately, but is short, tolerably light, breaking into small clods, is sweet, will

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be tempered without crusting or chopping in dry weather, or turning to mortar in wet. Next to that the dark grey and russet moulds are accounted the best: but the light and dark ash-coloured the worst, such as is usually found on common heathy ground: the clear tawney is by no means to be approved; but that of a yellowish red colour is the worst of all: this is commonly found in wild and waste parts of the country, and for the most part produces nothing but goss, furze, and fern, according as their bottoms are more or less of a light and sandy, or of a spewey, gravel, or clayey nature. 2. All lands that are good and wholesome, will, after rain, or breaking up by the spade, emit a good smell. 3. By the touch we may discover whether it consists of substances entirely arenaceous, or clammy; or, as it is expressed by Mr. Evelyn, whether it be tender, fatty, detestive, or slippery; or more harsh, gritty, porous, or friable.

MOULDINESS, a term applied to bodies which corrupt in the air, from some hidden principle of humidity therein; and whose corruption shews itself by a certain white down, or lanugo, on their surface; which, viewed through a microscope, appears like a kind of meadow, out of which arise herbs and flowers, some only in the bud, others full blown, and others decayed, each having its root, stalk, and other parts. See *Corruption* and *Vegetation*.

MOULDING, any thing cast in a mould, or that seems to have been so, though in reality it were cut with a chissel, or the ax.

Moulding of figures in paste is done as follows: take the crumb of a new-drawn white loaf, beat it, and roll it with a rolling-pin as fine and as far as it will go; then print it on the moulds; and when it has taken the suitable figure you desire, dry it in a stove, and it will be very hard: and to preserve it from vermin, you may mix a little powder of aloas with it.

To mould small figures of jasper-colour: oil your moulds with a fine pencil, and diversify them with such colours as you please, with gum tragacanth; if they spread or run, put a little of the gall of an ox, for the thicker it is, the harder it will be; then mould your paste of the colour of jasper, or the like; put it in to fill the mould; tie it with a wire, and take it out; repair and varnish it, and set it to harden.

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MOULDINGS, in architecture, projectures beyond the naked wall, column, wainscoat, &c. the assemblage of which forms corniches, door-cases, and other decorations, of architecture. See plate xxxiv.

Some mouldings are square, others round, some are streight, others curved, &c. and some are plain, others carved, or adorned with sculpture, either hollowed or in relievo: some again are crowned with a fillet, others are without, as the doucine, talon, ovolo, torus, scotia, astragal, gula, corona, &c. See *Loucine*, &c.

MOULTING, or **MEWING**. See *Mewing*.

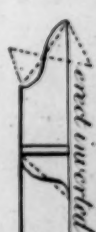
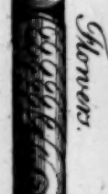
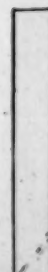
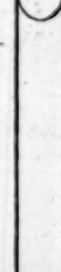
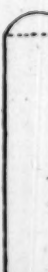
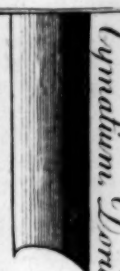
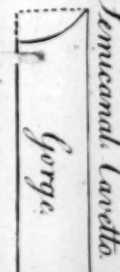
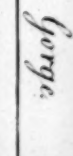
MOUND, a term used for a bank or rampart, or other fence, particularly that of earth.

MOUND, in heraldry, a ball or globe with a cross upon it, such as our kings are usually drawn with, holding it in their left hands, as they do the sceptre in the right.

MOUNT of Piety, certain funds or establishments in Italy, where money is lent out on small security. We had also mounts of piety in England raised by contribution, for the benefit of people ruined by the extortions of the Jews; but we have now no other mounts of piety but pawn-brokers, who generously lend money upon the best security, from 30 to 50 per cent.

MOUNTAIN, *Mens*, a part of the earth, rising to a considerable height above the level of the surface thereof. The origin of mountains is variously assigned by philosophers: some will have them coeval with the world, and created along with it; others, among whom is Dr. Burnet, will have them to take their rise from the deluge, urging that the extreme irregularity and disorder visible in them, plainly shews they do not come immediately out of the hand of God, but are the wrecks of the old world, broken into the abyss. See *Deluge*.

Others again alledge, from history, that the roots of many hills being eaten away, the hills themselves have subsided and sunk into plains; whence they conclude, that where the corruption is natural, the generation is so too. It appears certain to many, that some mountains must have been generated gradually, and have thrown up in process of time, from the sea shells, &c. found in them, which they suppose may be accounted for, from a violent wind blowing the sand, &c. into huge
heaps

	<i>Stalon or Ugea.</i>		<i>Cord inverted.</i>
	<i>Gorge & Denture Gula-Cyma.</i>		<i>Cymatium crest inverted.</i>
	<i>Mouchette & D'orle-Lancier.</i>		<i>Corona.</i>
	<i>Chandond & Jofite Gyle & Anchor.</i>		
	<i>Roca.</i>		<i>Guilbunde.</i>
	<i>Beads & Palmeter.</i>		<i>Thonnet.</i>
	<i>Banellette or Annulet Ruyte.</i>		<i>List Fillet.</i>
	<i>Daquette or Astragal.</i>		
	<i>Sore or Baton.</i>		
	<i>Trochilus Canal.</i>		
	<i>Lorian & Boullin.</i>		
	<i>Edinau, Round-Quarter Rota Astragal, crest inverted.</i>		
	<i>Cymatium, Domic & Gorge.</i>		<i>Lemicand.</i>
			<i>Gorge.</i>



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heaps, which were made into a mass by the rain, &c. The origin of mountains, in the opinion of Mr. Ray, seems to have been from explosions, by means of subterraneous fires; and he thinks it very probable, that they all have vast hollows beneath them; and that this might have been the means used at the creation, to make the dry land appear, he thinks no way dissonant to reason, since history proves that fires have raged in subterraneous caverns under the seas; and there is no natural impossibility in fires subsisting in such caverns, even when the earth was all over covered with water, as at the first creation.

Mountains appear to many, defects and blemishes in the earth: but they are truly of the utmost use and necessity to the well-being both of man and other animals. They serve as screens to keep off the cold and nipping blasts of the northern and eastern winds; they serve for the production of a great number of vegetables and minerals, which are not found in any other soil; the long ridges and chains of lofty and topping mountains being generally found to run from east to west, serve to stop the evagation of the vapours towards the poles, without which they would all run from the hot countries, and leave them destitute of rain. Mr. Ray adds, that they condense these vapours, like alembic heads, into clouds, and so, by a kind of external distillation, give origin to springs and rivers; and, by amassing, cooling, and constringing them, turn them into rain, and by that means render the fervid region of the torrid zone habitable.

MOUNTING, in the mechanic arts, something that serves to raise or set off a work: thus, the frame and its dependences make the mounting of a looking-glass; the hilt, the mounting of a sword; the fust, or but, the mounting of a carbine, musquet, &c. and the mounting of a fan, is the sticks which serve to open and shut it.

MOUNTING, in military affairs, signifies going upon duty: thus, mounting a breach, is running up to it; mounting the guard, is going upon guard; and mounting the trenches is going upon duty in the trenches: but mounting a cannon, mortar, &c. is the setting it on its carriage, or the raising its mouth.

MOUSE, in zoology, a species of mus, with a long and almost naked tail, and a white belly.

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MOUTH, in anatomy, a part of the face, consisting of the lips, the gums, the insides of the cheeks, the palate, the salival glands, the os hyoides, the uvula, and the tonsils, which see under their proper articles.

MUCILAGE, in pharmacy, in general any viscid and glutinous liquor.

MUCILAGE also denotes a thick pituitous matter, evacuated with the urine, in the gravel and dysuria.

MUCILAGE also imports the liquor which principally serves to moisten the ligaments and cartilages of the articulations; and is supplied by the mucilaginous glands.

MUCILAGINOUS GLANDS, in anatomy, a very numerous set of glands, serving to secrete the mucilage of the joints.

MUCOUS GLANDS, in anatomy, three glands, which empty themselves into the urethra; so called by their first discoverer, Mr. Cowper, from the tenacity of the liquor which they separate.

MUCUS, a mucilaginous liquor separated by the mucous glands, and the nostrils.

MUFFLE, in metallurgy, an arched cover, resisting the strongest fire, and made to be placed over coppels and tests, in the operations of assaying, to preserve them from the falling of coals and ashes into them; though at the same time of such a form as is no hindrance to the action of the air and fire on the metal, nor to the inspection of the assayer.

MUFTI, or **MUPHTI**, the chief of the ecclesiastical order, or primate, of the musliman religion. The authority of the mufti is very great in the Ottoman empire; for even the sultan himself, if he would preserve any appearance of religion, cannot, without hearing his opinion, put any person to death, or so much as inflict any corporal punishment.

The election of the mufti is solely in the grand signior, who presents him with a vest of rich fables, &c. If he is convicted of treason, or any great crime, he is put into a mortar, kept for that purpose in the Seven Towers at Constantinople, and pounded to death.

MUGGLETONIANS, a religious sect, which arose in England, about the year 1657; so denominated from their leader Lodowick Muggleton, a journeyman taylor, who, with his associate Reeves, set up for great prophets, pretending, as it is said, to have an absolute power of saving and damning whom they pleased;

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and giving out, that they were the two last witnesses of God that should appear before the end of the world.

MUGWORT, in botany, the same with the artemisia. See *Artemisia*.

MUID, a large measure, in use among the French, for things dry. The muid is no real vessel used as a measure, but an estimation of several other measures, as the septier, mine, minot, bushel, &c.

MUID is also one of the nine casks, or regular vessels used in France, to put wine and other liquors in. The muid of wine is divided into two demi-muids, four quarter-muids, and eight half-quarter muids, containing thirty-six septiers.

MULATTO, a name given in the Indies to those who are begotten by a negro man on an Indian woman, or an Indian man on a negro woman.

MULBERRY, *Morus*, in botany, a genus of plants. There are several species of this tree; but two only are generally cultivated, called the black and white mulberry. The black mulberry grows naturally in Persia, from whence it was first brought to the southern parts of Europe; but is now become common in every part of Europe, where the winters are not very severe: for in the northern parts of Sweden, these trees will not live in the open air; and in several parts of Germany they are planted against walls, and treated in the same way as peach and other tender fruits are here. These trees are generally of both sexes, having male flowers or katkins, on the same tree with the fruit; but it often happens that some of the trees which are raised from seeds, have only male flowers, and produce no fruit; so that those who plant these trees for their fruit, should never make choice of such as have been propagated by seeds, unless they have seen them produce fruit in the nursery. It is also the surest way to mark such trees as are fruitful in the nursery, at the time when their fruit is upon them, because those trees which are propagated by layers, are sometimes of the male sort.

The old mulberry trees are not only more fruitful than the young, but their fruit are much larger and better flavoured; so that where there are any of these old trees, it is the best way to propagate from them, and to make choice of those branches which are most fruitful. The usual method of propagating these trees, is by laying down their branches, which will take root in one year, and are then se-

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parated from the old trees; but as the most fruitful branches are often so far from the ground as not to be layed, unless by raising of boxes or baskets of earth upon supports for this purpose, so the better way is to propagate them by cuttings, which, if rightly chosen and skilfully managed, will take root very well; and in this method there will be no difficulty in having them from trees at a distance, and from the most fruitful branches. These cuttings should be the shoots of the former year, with one joint of two years wood to their bottom; the cuttings should not be shortened, but planted their full length, leaving two or three buds above ground. The best season for planting them is in March, after the danger of hard frost is over; they should be planted in light rich earth, pressing the ground pretty close about them; and if they are covered with glasses, it will forward their putting out roots; but where there is no such conveniency, the ground about them should be covered with moss to prevent its drying; and where this is carefully done, the cuttings will require but little water, and will succeed much better than with having much wet. If the cuttings succeed well and make good shoots, they may be transplanted the following spring into a nursery, where they should be regularly trained to stems, by fixing down stakes to each, to which the principal shoots should be fastened; and most of the lateral branches should be closely pruned off, leaving only two or three of the weakest to detain the sap for the augmentation of the stem; for when they are quite divested of the side shoots, the sap is mounted to the top, so that the heads of the trees grow too fast for the stems, and become too weighty for their support. In about four years growth in the nursery, they will be fit to transplant where they are to remain; for these trees are transplanted with greater safety while young, than when they are of a large size.

The white mulberry is commonly cultivated for its leaves to feed silk worms, in France, Italy, &c. though the Persians always make use of the common black mulberry for that purpose; and it is said that the worms fed with those of the black produce much better silk than those fed with the white; but it is to be observed, that the leaves of the black sort should never be given to the worms, after they have eaten for some time of the white, lest the worms should burst, which

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is often the case when they are thus treated.

The trees which are designed to feed silk worms, should never be suffered to grow tall, but rather kept in a sort of hedge; and instead of pulling off the leaves singly, they should be sheared off, together with their young branches, which is much sooner done, and not so injurious to the tree.

This white sort may be propagated either from the seeds or lays of the black mulberry, and is equally hardy; but the most expeditious method of raising these trees in quantity, is from the seeds, which may be procured in plenty from the south of France and Italy. The best way to sow these seeds in England, is to make a moderate hot bed, which should be arched over with hoops, and covered with mats; upon this bed the seeds should be sown in the middle of March, and covered over with light earth about a quarter of an inch deep: in very dry weather the bed must be frequently watered, and in the heat of the day shaded with mats, and also covered in the nights when they are cold. With this management the plants will come up in five or six weeks, and as they are tender when they first appear, so they must be guarded against frosty mornings, which often happens in May. During the summer they must be kept clean from weeds, which is all the culture they require: but there must be care taken of them the first winter, especially to cover them in autumn, when the first frosts come, which will kill the tender plants to the ground, if they are not protected; the following March these plants should be transplanted in the nursery, to get strength, where they may remain two or three years, and then should be removed where they are to continue.

This mild dulco-acid fruit is sometimes used medicinally, as a refrigerant, antiseptic, relaxant, attenuant, and aperient. Boerhaave looks upon the continued use of mulberries as one of the principal remedies in cases of obstruction and viscosity, and in putrid disorders; and Hoffman gives instances of some obstinate diseases being cured by them; this fruit apparently promotes the alvine and urinary excretions; and in some fevers, where watery liquors run off almost unchanged, the urine is impregnated with the colour of the juice of the berries. To persons of a bilious temperament and rigid fibres, and where the habit is dispos-

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ed, naturally or from extrinsic causes, to an inflammatory or putrescent state, their moderate and even plentiful use, is salubrious: by those of a cold inactive disposition, where the vessels are lax, the circulation languid, and the digestion weak, this fruit should be taken very sparingly.

MULCT, a fine of money laid upon a man, who has committed some fault or misdemeanor.

MULE, in zoology, a mongrel kind of quadruped, usually generated between an ass and a mare, and sometimes between a horse and a she-ass. The mule is a sort of a monster, of a middle nature between its parents, and therefore incapable of propagating its species; so careful is nature to avoid filling the world with monsters. Mules are chiefly used in countries where there are rocky and stony roads, as about the Alps, Pyrenees, &c. Great numbers of them are kept in these places; they are usually black, strong, well-limbed, and large, being mostly bred out of the fine Spanish mares: the mules are sometimes fifteen or sixteen hands high. No creatures are so proper for carrying large burdens, and none so sure-footed. They are much stronger for draught than our horses, and are often as thick-set as our dray horses; and they will travel several months together, with six or eight hundred weight upon their backs: they are much harder and stronger than horses, and will live and work twice the age of a horse; and those mules which are light are fitter for riding than horses, as to the walk and trot; but they are apt to gallop rough.

MULIER, in law, signifies the lawful issue born in wedlock, though begotten before.

MULLER, or MULLAR, a stone flat and even at the bottom, but round a-top, used for grinding of matters on a marble. The apothecaries use mullers to prepare some of their testaceous powders, and painters for their colours, either dry or in oil.

MULLER is also an instrument used by the glass-grinders.

MULLET, *Mugil*, in ichthyology, a genus of the acanthopterygious fishes, the head of which is of a depressed form in the anterior part, and the body oblong and compressed.

MULLET, or MOLLET, in heraldry, a bearing in form of a flat, or rather of the rowel of a spur, which it originally represented.

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MULSUM, *Mulfe*, a liquor made of wine and honey, or even of wine and water.

MULTIPLE, *Multiplex*, in arithmetic, a number which comprehends some other several times; thus 6 is a multiple of 2, and 12 is a multiple of 6, 4, and 3, comprehending the first twice, the second thrice, &c.

MULTIPLE RATIO, or **PROPORTION**, is that which is between multiples. If the lesser term of the ratio be an aliquot part of the greater, the ratio of the greater to the less is called multiple; and that of the less to the greater sub-multiple. A sub-multiple number is that contained in the multiple; thus, the numbers 1, 2, and 3, are sub-multiples of 9. Duple, triple, &c. ratios, as also subduples, subtriples, &c. are so many species of multiple and sub-multiple ratios. See *Ratio*.

MULTIPLICAND, in arithmetic, one of the factors in the rule of multiplication; being that number which is given to be multiplied by another, which is called the multiplier, or multiplier.

MULTIPLICATION, in arithmetic, the art of multiplying one number by another, to find the product, or it is a compendious method of performing the operation of addition.

There are some abbreviations of this art. Thus to multiply a number by 5, you need only add a cypher to it, and then halve it. To multiply by 9, add a cypher to the given multiplicand, and subtract the multiplicand therefrom, the remainder must certainly be nine times the number which was given to be multiplied. To multiply by 15, first multiply it by 10, which is done by annexing a cypher to it, to which add the product by 5, the sum will be the required product.

Expedients for the more easy and expeditious multiplying large sums are sliding rules, and Neper's bones; the want of which may be supplied by tabulating the multiplicand.

Where the multiplier is not composed wholly of integers, as it frequently happens in business, where pounds are accompanied with shillings and pence, yards with feet and inches; the method of procedure, if you multiply by a single digit, is the same as in simple numbers, only carrying from one denomination to another, as the nature of each specie requires. E. gr. to multiply 123 l. 14 s. 9 d. 3 q. by 5; say, $5 \times 3 \text{ q.} = 15 \text{ q.}$

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that is, 3 d. 3 q. write down the 3 q. and proceed, saying $5 \times 9 = 45 \text{ d.}$ that is, 3 s. 9 d. set down the 9 d. and proceed in the same manner through the rest.

If you multiply by two or more digits, the methods of procedure are as follow: suppose I have bought 37 ells of cloth at 13 l. 16 s. 6 d. per ell, and would know the amount of the whole. I first multiply 37 ells by the 13 l. in the common method of multiplication by integers, leaving the two products without adding them up; then multiply the same 37 ells by 16 s. leaving, in the like manner, the two products without adding them. Lastly, I multiply the same 37 by the 6 d. the product whereof is 222 d. which divided by 12, gives 18 s. 6 d. and this added to the products of the 16 s. the sum will be 610 s. 6 d. the amount of 37 ells at 16 s. 6 d. the ell. Lastly, the 610 s. 6 d. are reduced into pounds, by dividing them by 20: upon adding the whole, the amount of 37 ells at 13 l. 16 s. 6 d. per ell will be found as in the following:

37 ells	37 ells.
At 13 pounds.	At 16 shillings.
111	222
37	37
30.10.6	18.6
Product 511.10.6	610.6
37 ells.	
At 6 pence.	
222	

Or thus: suppose the same question: reduce the 13 l. 16 s. into shillings, the amount will be 276 s. reduce 276 s. into pence, adding 6, the amount will be 3318 d. Multiply the 37 ells by 3318, the amount will be 122766 d. which divided by 12, and the quotient 10230 s. 6 d. reduced into pounds by cutting off the last figure on the right hand, and taking half of those on the left, yields 511 l. 10 s. 6 d. the price of the 37 ells as before. Though by these two methods any multiplication of this kind may be effected, yet the operations being long, we shall add a third much shorter.—Suppose the same question: Multiply the price by the factors of the multiplier, if resolvable into factors; if not, by those that come nearest it; adding the price for the odd one, or multiplying it by what the factors want of the multiplier. So the

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the work will stand thus : 37 ells at
16s. 6d. : $6 \times 6 = 36 \times 1 = 37$.

Therefore	—	6
	82	19 0
	497	14 0
	13	16 6
	511	10 6

The price of the 37 ells

But the most commodious is the fourth method, which is performed by aliquot and aliquant parts—where you are to observe by the way, that aliquot parts of any thing are those contained several times therein, and which divide without any remainder ; and that aliquant parts are other parts of the same thing composed of several aliquot parts.

To multiply by aliquot parts, is, in effect, only to divide a number by 3, 4, &c. which is done by taking a 3d, 4th, 5th, &c. from the number to be multiplied. Example.—To multiply v. g. by 6s. 8d. Suppose I have 347 ells of ribband at 6s. 8d. per ell.

Multiplicand	—	347 ells
Multiplicator	—	6s. 8d.

Product — 115l. 13s. 4d.

The question being stated, take the multiplicator, which according to the table of aliquot parts, is the third ; and say, the third of 3 is 1, set down 1 ; the third of 4 is 1, set down 1, remains 1, that is 1 ten, which added to 7 makes 17 ; then the third of 17 is 5, remain 2 units, i. e. two thirds, or 13s. 4d. which place after the pounds. Upon numbering the figures, 1, 1, and 5, integers, and 13s. 4d. the aliquot part remaining, I find the sum 115l. 13s. 4d.

For multiplication by aliquant parts : suppose I would multiply by the aliquant part 19s. I first take for 10s. half the multiplicand ; then for 5, which is the fourth, and lastly, for 4 which is the fifth. The products of the three aliquot parts that compose the aliquant part being added together, the sum will be the total product of the multiplication, as in the following example ; which may serve as a model for multiplication by any aliquant part that may occur.

Multiplicand	—	356 ells.
Multiplicator	—	19s.
	178l.	for 10s.
	89l.	for 5s.
	71l.	4s. for 4s.
Product	—	338l. 4s.

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For the Proof of MULTIPLICATION.

The operation is right when the product, divided by the multiplier, quotes the multiplicand ; or divided by the multiplicand, quotes the multiplier. A readier way, though not absolutely to be depended on, is thus : Add up the figures of the factors, casting out the nines : and setting down the remainders of each, these multiplied together, and out of their product cast away the nines, and set down the remainder ; if this remainder agree with the remainder of the product, after the nines are cast out, the work is right. This method of proving multiplication by casting out the nines, depends upon a peculiar property of the number 9, which no other digit has, viz. that the remainder will be exactly the same, whether we divide any number whatsoever by 9, or first add together the digits composing that number, and then divide the sum by 9. This premised, let F and f represent any proposed factors or numbers that are to be multiplied together ; then will $F \times f$ be the product : let also m and n represent the respective remainders after having divided each of those factors by 9, or, which is the same thing, after having cast out the nines : then it is evident that $F - m$, $f - n$, and $F - m \times f - n$ being respectively divided by nine, will exactly terminate without any remainder ; but $F - m \times f - n$ is equal to $F \times f - Fm - fn + mn$, therefore Ff being divided by 9, must leave the same remainder as $m \times n$ divided by 9 ; or the sum of the digits in the product mn must, when divided by 9, leave the same remainder as the sum of the digits in the product Ff would when divided by 9.

Cross MULTIPLICATION, otherwise called duodecimal arithmetic, is an expeditious way of multiplying feet and inches by feet and inches. This method is used in measuring, &c.—The method is thus :

Suppose 5 feet 3 inches to be multiplied by 2 feet 4 inches : say,

2 times 5 feet is 10 feet, and 2	F.	I.
times 3 is six inches : again, 4	5	3
times 5 is 20 inches, or 1 foot	2	4
8 inches ; and 4 times 3 is twelve	10	6
parts, or 1 inch : the whole sum	1	8
makes 12 feet 3 inches. In this		1
manner you may manage yards,	12	3
feet, inches, and parts, &c.		

MULTIPLICATION of Algebra.—In multiplication the general rule of the signs

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signs is, that when the signs of the factors are alike (i. e. both + or both -) the sign of the product is +; but when the signs of the factors are unlike, the sign of the product is -.

Case 1. When any positive quantity, $+a$, is multiplied by any positive number, $+n$, the meaning is, that $+a$ is to be taken as many times as there are units in n ; and the product is evidently na .

Case 2. When $-a$ is multiplied by n then $-a$ is to be taken as often as there are units in n ; and the product must be $-na$.

Case 3. Multiplication by a positive number implies a repeated addition: but multiplication by a negative implies a repeated subtraction. And when $+a$ is to be multiplied by $-n$, the meaning is that $+a$ is to be subtracted as often as there are units in n ; therefore the product is negative, being $-na$.

Case 4. When $-a$ is to be multiplied by $-n$, then $-a$ is to be subtracted as often as there are units in n ; but to subtract $-a$ is equivalent to adding $+a$, consequently the product is $+na$. The second and fourth cases may be illustrated in the following manner:

It is evident that $+a-a=0$ therefore if we multiply $+a-a$ by n , the product must vanish or be 0, because the factor $a-a$ is 0. The first term of the product is $+na$ (by case 1.) Therefore the second term of the product must be $-na$, which destroys $+na$; so that the whole product must be $+na-na=0$. Therefore, $-a$ multiplied by $+n$ gives $-na$.

In the like manner if we multiply $+a-a$ by $-n$, the first term of the product being $-na$, the latter term of the product must be $+na$, because the two together must destroy each other, or their amount be 0, since one of the factors (viz $a-a$) is 0. Therefore, $-a$ multiplied by $-n$ must give $+na$.

If the quantities to be multiplied are simple, find the sign of the product by the last rule; after it place the product of the co-efficients, and set down all the letters after one another as before.

EXAMPLES.

$$\begin{array}{r} \text{Mult. } +a \quad | \quad -2a \quad | \quad +6x \\ \text{By } +a \quad | \quad +4b \quad | \quad -5a \\ \hline \text{Product } +ab \quad -8ab \quad -30ax \\ \text{Mult. } -8x \quad | \quad +3ab \\ \text{By } -4a \quad | \quad -5ac \\ \hline \text{Product } +32ax \quad -15abc. \end{array}$$

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To multiply compound quantities, you must multiply every part of the multiplicand by all the parts of the multiplier taken one after another, and then collect all the products into one sum: the sum shall be the product required.

$$\begin{array}{r} \text{Mult. } a+b \quad | \quad 2a-3b \\ \text{By } a+b \quad | \quad 4a+5b \\ \hline \text{Prod. } \left\{ \begin{array}{l} aa+ab \\ +ab+bb \end{array} \right\} \left\{ \begin{array}{l} 2aa-12ab \\ +10ab-15bb \end{array} \right\} \\ \text{Sum } aa+2ab+bb \quad | \quad 8aa+2ab-15bb \\ \hline \text{Mult. } 2a-4b \quad | \quad xx-ax \\ \text{By } 2a+4b \quad | \quad x+a \\ \hline \text{Prod. } \left\{ \begin{array}{l} 4aa-8ab \\ +8ab-16bb \end{array} \right\} \left\{ \begin{array}{l} xxx+axx \\ +axx-aax \end{array} \right\} \\ \text{Sum } 4aa \dots 0 \dots -16bb \quad | \quad xxx \dots 0 \dots -aax \\ \hline \text{Mult. } a+a+b+bb \\ \text{By } a-b \\ \hline \text{Prod. } \left\{ \begin{array}{l} aaa+aab+abb \\ -aab-abb-bbb \end{array} \right\} \\ \text{Sum } aaa \dots 0 \dots 0 \dots -bbb \end{array}$$

Products that arise from the multiplication of 2, 3, or more quantities, as, a, b, c , are said to be of 2, 3, or more dimensions; and those quantities are called factors or roots.

If all the factors are equal, then these products are called powers; as aa or aaa are powers of a . Powers are expressed sometimes by placing, above the root to the right hand, and figure expressing the number of factors that produce them, thus:

$$\begin{array}{l} a \\ aa \\ aaa \\ aaaa \end{array} \left\{ \begin{array}{l} 1^{\text{st}} \\ 2^{\text{d}} \\ 3^{\text{d}} \\ 4^{\text{th}} \end{array} \right\} \left\{ \begin{array}{l} \text{power of the} \\ \text{root, } a \text{ and is} \\ \text{generally ex-} \\ \text{pressed thus:} \end{array} \right\} \left\{ \begin{array}{l} a^1 \\ a^2 \\ a^3 \\ a^4 \end{array} \right.$$

These figures which express the number of factors that produce powers are called their indices or exponents; thus 2 is the index of a^2 . And powers of the same root are multiplied by adding their exponents thus: $a^2 \times a^3 = a^5$, $a^4 \times a^3 = a^7$, $a^3 \times a = a^4$.

Sometimes it is useful not actually to multiply compound quantities, but to set them down upon the sign of multiplication ($\times$) between them, drawing a line over each of the compound factors. Thus $a+b \times a-b$ expresses the product of $a+b$ multiplied by $a-b$.

MULTIPLICATION of Surds. When the quantities are pure surds of the same kind, multiply them together, and to their product prefix their radical sign.

Thus

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Thus $\sqrt{b} \times \sqrt{a} = \sqrt{ba}$, and $\sqrt{ba + aa} \times \sqrt{ca} = \sqrt{bcaa + dcaa}$.

If the surd quantities of the same kind are joined to rational quantities, then multiply the rational into the rational, and the surd into the surd, and join their products together. Thus $d\sqrt{bc} \times 3b\sqrt{a} = 3db\sqrt{bca}$, and $5cd\sqrt{ba} + da \times 3a\sqrt{ca} = 15cda\sqrt{bcaa} + d:aa$.

MULTIPLICATOR, or **MULIPLIER**, in arithmetic, a number multiplying another called the multiplicand.

MULTIPLYING GLASS, in optics, one wherein objects appear increased in number.

MULTISILOQUOUS PLANTS those which have after each flower many distinct, long, slender, filiquæ, or pods, in which their seed is contained: such are bear's foot, columbine, house-leek, navel-wort, orpine, &c.

MULTITUDE, an assemblage or collection of a great number of distinct persons or things: thus we say, a multitude of men, of horses, of trees, &c.

MUM, a kind of malt-liquor, much drank in Germany, and chiefly brought from Brunswic, which is the place of most note for making it. The process of brewing mum, as recorded in the town-house of that city, is as follows: Take sixty-three gallons of water that has been boiled till one third part is consumed, and brew it with seven bushels of wheaten malt, one bushel of oat malt, and one bushel of ground beans: when it is tunned, the hogsheed must not be filled too full at first: as soon as it begins to work, put into it three pounds of the inner rind of fir; one pound of the tops of fir and beech; three handfuls of cardus benedictus; a handful or two of the flowers of rosa-solis; add burnet, betony, marjoram, avens, penny-royal, and wild thyme, of each a handful and a half; of elder-flowers, two handfuls or more; seeds of cardamum bruised, thirty ounces; barberries bruised, one ounce; when the liquor has worked a while, put the herbs and seeds into the vessel; and, after they are added, let it work over as little as possible; then fill it up: lastly, when it is stopped, put into the hogsheed ten new-laid eggs unbroken; stop it up close, and drink it at two years end. Our English brewers, instead of the inner rind of fir, use cardamum, ginger, and saffras; and also add clecampane, madder, and red sanders.

MUMMY, a body embalmed or dried,

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in the manner used by the ancient Egyptians: or the composition with which it is embalmed. There are two kinds of bodies denominated mummies: the first are only carcases dried by the heat of the sun, and by that means kept from putrefaction: these are frequently found in the sands of Lybia. Some imagine that these are the bodies of deceased people buried there on purpose to keep them entire without embalming; others think they are the carcases of travellers who have been overwhelmed by the clouds of sand raised by the hurricanes frequent in those deserts. The second kind of mummies are bodies taken out of the catacombs, near Cairo, in which the Egyptians deposited their dead, after embalming.

MUMMY, among gardeners, a kind of wax used in grafting and planting the roots of trees.

MUNDIC, in natural history, a metallic mineral more commonly called marcasite.

* **MUNICH**, a very large town of Germany, and the capital of Bavaria. It is one of the handsomest cities of Germany, and is surrounded with thick walls, deep ditches, and bulwarks. The streets are broad and regular, the houses well built, and painted on the outside. The elector's palace is seated on the extremity of the city, and has two thousand and sixty windows, twenty great halls, eleven courts, nine galleries, sixteen kitchens, and twelve cellars. It is one of the most magnificent and most commodious palaces in Europe. In 1729 part of it was consumed by fire. However, the part that was burnt was soon rebuilt. The cabinet of rarities, the library, the arsenal, and the gardens of the elector, deserve attention. In the church of Notre Dame, which is the cathedral, there are twenty-four large columns, twenty-five chapels, and thirty altars; the two towers, and the tomb of the emperor Lewis of Bavaria are the most remarkable in this city. The Austrians, in 1742, laid siege to this city, which was obliged to surrender, and the inhabitants were forced to pay twenty-five thousand franks, by way of contribution. It is a place of little trade. It is thirty miles south-east of Augsberg, and one hundred and seventy-five south-west of Prague. Lat. 48. 22. N. Long. 11. 41. E.

MUNICIPAL, in the Roman civil law, an epithet which signifies, invested with the rights and privileges of Roman citizens. Thus the municipal cities were

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those whose inhabitants were capable of enjoying civil offices in the city of Rome.

MUNIMENTS, or **MINIMENTS**, the writings relating to a person's inheritance, by which he is enabled to defend his title to his estate: or, in a more general sense, all manner of evidences, such as charters, feoffments, releases, &c.

MUNIMENT-HOUSE, a little strong room in a cathedral, college, or university, destined for keeping the seal, charters, &c. of such cathedral, college, &c.

MURAL, in general, any thing belonging to a wall, which the Latins call *murus*.

MURAL ARCH, a wall, or walled arch, placed exactly in the plane of the meridian, for fixing a large quadrant, sextant, or other instrument, in order to observe the meridian altitudes of the heavenly bodies.

MURAL CROWN. See *Crown*.

MURDER, or **MURDER**, in law, the wilful and felonious killing a person from premeditated malice; provided the party wounded, or otherwise hurt, die within a year and a day after the fact was committed.

MUREX, in natural history, a genus of univalve or simple shells, without any hinge, formed of a single piece, and beset with tubercles or spines: the mouth is large and oblong, and has an expanded lip, and the clavicle is rough.

MURRAIN, or **GARGLE**, a contagious disease among cattle. The most remarkable murrain is that mentioned in the Philosophical Transactions, which spread through Switzerland, Germany, into Poland, &c.

The contagion seemed to propagate itself, in form of a blue mist, which fell on the grass where the cattle grazed, when whole herds, forbearing their food, almost died away in twenty-four hours. Upon dissection were found large corrupted spleens, sphacelous and corroded tongues, &c. And even the persons who managed them were infected, and died like the beasts. Some imagined it had its rise from noxious vapours thrown out of the earth, in three earthquakes perceived in the neighbourhood of the place where it began; though Dr. Stare thinks it rather owing to swarms of volatile insects. The antidote for the sound, and medicine for the sick, was equal parts of foot, gunpowder, brimstone, and salt, with as much water as would wash it down: a spoonful was the dose.

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MURREY, in heraldry, a kind of purple colour. See *Sanguine*.

MUS, in zoology, a genus of quadrupeds, of the order of the agriæ, the characters of which are these: the fore-teeth are acute, and there are no canine teeth at all, the feet are divided, and the ears naked.

Of this genus there are a great many species, known by distinct English names, as the rat, mouse, dor-mouse, or forex, citille, agatis, guinea-pig, &c.

MUSA, the plantain tree, in botany.

MUSCADINE, a rich kind of wine, of the growth of Provence and Languedoc in France.

MUSCLE, *Musculus*, in anatomy, a part of the human body, destined to move some other part, and that in general by a voluntary motion, or such as is dictated by the will; being composed principally of flesh and tendinous fibres, which have also vessels of all kinds, as arteries, veins, nerves, and lymphatics; all which are surrounded by, or inclosed in, one common membrane.

Action of the MUSCLES. This consists in the contraction of its belly, after whatever manner that is done: by this means its extremities approach toward each other; and by this means also the part in which the end of the muscle is inserted, moves as if it were drawn by a cord.

MUSCLE, *Mytilus*, in natural history, a shell composed of two valves, of an oblong figure, and shutting close all the way; the valves are both convex, and of a similar shape; and the animal inhabiting it is called a tethys.

MUSCULAR, or **MUSCULOUS**, in anatomy, something relating to, or partaking of the nature of a muscle. See *Muscle*.

MUSES, certain fabulous divinities amongst the Pagans, supposed to preside over the arts and sciences: for this reason it is usual for the poets at the beginning of a poem, to invoke these goddesses to their aid. Some reckon the muses to be no more than three, viz. Mneme, Aæde, and Melete; that is, memory, singing, and meditation; but the most ancient authors, and particularly Homer and Hesiod, reckon nine; Clio, which means glory; Euterpe, pleasing; Thalia, flourishing; Melpomene, attracting; Terpsichore, rejoicing the heart; Erato, the amiable; Polyhymnia, a multitude of songs; Urania, the heavenly; and Calliope, sweetness

of voice: To Clio, they attributed the invention of history; to Melpomene, tragedy; to Thalia, comedy; to Euterpe, the use of the flute; to Terpsichore, the harp; and to Erato, the lyre and lute; to Calliope, heroic verse; to Urania, astrology; and to Polyhymnia, rhetoric. The muses are painted young, handsome, and modest, agreeably dressed, and crowned with flowers. Their business was to celebrate the victories of the gods, and to inspire and assist the poets; hence the custom of invoking their aid at the beginning of a poem. It must not, however, be imagined, that the ancient poets themselves ever considered the deities thus invoked as divine persons, from whom they expected any real help. Their addresses to the muses are mere allegories, and manners of expressing themselves poetically, as when they make gods of sleep, of fame, of virtue, and other natural and moral things; under the name of muse they prayed for the genius of poetry, and all the talents necessary for a happy execution of what they had undertaken.

MUSEUM, a name which originally signified a part of the palace of Alexandria, which took up at least one fourth of that city. This quarter was called the Museum, from its being set apart for the muses and the study of the sciences. Here were lodged and entertained the men of learning, who were divided into many companies or colleges, according to the sciences of which they were the professors; and to each of these houses or colleges was allotted a handsome revenue. The foundation of this establishment is attributed to Ptolemy Philadelphus, who here placed his library. Hence the word museum is now applied to any place set apart as a repository for things that have an immediate relation to the arts. The British museum of curiosities at Montague-house was established in 1753.

MUSHROOM, *fungus*, in botany, a genus of imperfect plants, composed of a pedicle, crowned with a broad head, convex and smooth at the top, and hollow, foliated, lamellated, or fistulous on the under side. Mr. Miller directs the following method of cultivating them. If you have no beds of your own that produce them, you should look abroad in rich pastures, during the months of August and September, till you find them; and then opening the ground about their roots, you will often find the earth full of small white knobs, which are the off-

sets from the mushrooms: these should be carefully gathered, and preserved dry, with the earth about them. The mushroom-beds should be made of dung in which there is good store of litter. These beds should be made on dry ground, and the dung be laid upon the surface about a foot thick, two feet and a half broad, and of a length in proportion to the quantity of mushrooms desired: it should be covered about four inches deep with strong earth; upon this lay more dung, about ten inches thick; then another layer of earth; still drawing in the sides of the bed, so as to form it like the ridge of an house, which may be done by three layers of dung and as many of earth. When the bed is finished it should be covered with litter, to keep out the wet and prevent its drying; in this situation it may remain eight or ten days, by which time it will be of a proper degree of warmth; the litter should then be taken off, the sides of the bed smothered, and a covering of light rich earth should be laid over the bed: upon this the small roots or off-sets of the mushrooms should be put, placing them two or three inches asunder; then gently cover them about half an inch thick with the same light earth; and again put on the covering of litter. The great skill in managing these beds is that of keeping them in a proper temperature of moisture. By this means mushrooms may be produced all the year; and when the beds are destroyed, the surface which contains the dust and roots of the mushrooms should be laid by in a dry place for a fresh supply, till the proper time of using it. *Miller's Gard. Dict.*

MUSIC, one of the seven sciences, commonly called liberal, and comprehended also among the mathematical, as having for its object discreet quantity or number, but not considering it in the abstract like arithmetic, but in relation to time and sound, in order to make a delightful harmony: or, it is the art of disposing and conducting sounds considered as acute and grave; and proportioning them among themselves, and separating them by just intervals pleasing to the sense. Mr. Malcolm defines it a science that teaches how sound, under certain measures of time and tune, may be produced; and so ordered and disposed, as either in consonance or succession, or both, they may raise agreeable sensations.

MUSK, *Moschus*, in the materia medica

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alca, an odoriferous grumous substance, found in a little bag, situated near the umbilical region of an oriental quadrupede, which is said by some to bear the greatest resemblance to the goat, by others to the stag kind. The best musk is brought from Tonquin in China, an inferior sort from Agria and Bengal, and a still worse sort from Russia. Fine musk comes over in round thin bladders, generally about the size of pigeons eggs, covered with short brown hairs well filled, and without any aperture, or any appearance of their having been opened. The musk itself is dry, with a kind of unctuousity; of a dark reddish brown, or rusty blackish colour; in small round grains, with very few hard black clots; perfectly free from any sandy or other visible foreign matter. Chewed, and rubbed with a knife on paper, it looks bright, yellowish, smooth, and free from grittiness. Laid on a red-hot iron, it catches flame, and burns almost entirely away, leaving only an exceeding small quantity of light greyish ashes: if any earthy substances have mixed with the musk, the quantity of the residuum will discover them. This concrete has a bitterish subacid taste; and a fragrant smell, agreeable at a distance, but so strong as to be disagreeable when smelt too near, unless weakened by a large admixture of other substances. It is not only said to vary in goodness according to the season of its being taken from the animal, but which is oftentimes so artfully sophisticated, that the abuses cannot be discovered by any external characters, or by any other known means than the degree of its specific smell and taste.

MUSK, a medicine of great esteem in the eastern countries, has lately come into use amongst us, also, in some nervous disorders; though liable, by its strong impression on the organs of smell, to offend and disorder hysterical persons and constitutions of great sensibility, yet when taken internally, it is found to abate symptoms of that kind, which its smell produces, and to be one of the principal medicines of the antispasmodic class. Dr. Wall informs us, that two persons labouring under a subcaltus tendinum, extreme anxiety, and want of sleep, occasioned by the bite of a mad dog, were perfectly relieved by two doses of musk of 16 grains each: that convulsive hiccoughs, attended with the worst symptoms, were removed by a dose or two of ten grains; that in some cases, where this medicine

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could not, on account of strong convulsions, be administered by the mouth, it proved of service when injected as a clyster: that he never met with any person, how averse soever to perfumes, but could take it in the form of a bolus without inconvenience: that under the quantity of six grains, he never found much effect from it, but that when given to ten grains and upwards, it produces a mild diaphoresis, without heating or giving any uneasiness, but on the contrary, abating pain and raising the spirits; and that after the sweat has begun, a refreshing sleep generally succeeds. This medicine has been tried also in some maniacal cases, in which it seemed to procure a temporary relief.

MUSKET, a fire-arm borne on the shoulder, and used in war. The length of a musket is fixed at three feet eight inches from the muzzle to the pan, and it carries a ball of sixteen to the pound. In fortification, the length of the line of defence is limited by the ordinary distance of a musket-shot, which is about 120 fathoms; and the length of almost all military architecture is regulated by this rule.

MUSKETTOON, a kind of short thick musket, whose bore is the thirty-eighth part of its length: it carries five ounces of iron, or seven and a half of lead, with an equal quantity of powder. This is the shortest sort of blunderbusses.

MUSLIN, a fine thin sort of cotton cloth, which bears a downy nap on its surface. There are several sorts of muslins brought from the East Indies, and more particularly from Bengal; such as doreas, betelles, mulmuls, tanjees, &c.

* MUSSLEBURGH, battle at. This battle was fought on the 10th day of September 1547, between the English and Scots. Henry VIII. had agreed with the Scots, that his son (now Edward VI. king of England) should marry their young queen. The prospect of this match, by which the English would become masters of Scotland, was extremely disagreeable to France. These two kingdoms had ever been allied to each other, and the former had always been of great use to the latter in her wars with England. To prevent, therefore, the loss of such a convenient ally, the French emissary in Scotland established a powerful opposition to the intended alliance with England, and succeeded so far, that the duke of Somerset, whom Henry had appointed

appointed protector during the minority of his son, thought himself obliged by force of arms to compel the Scots to execute the contract. Accordingly he entered the Scottish territories, at the head of fifteen thousand foot, and three thousand horse. On the other hand, the Scots, to the number of thirty thousand, with thirty pieces of cannon, were ready to receive the invaders. Before the protector would engage the enemy, he sent a letter to the earl of Arran, the Scottish regent, assuring him, his intention was not to hurt the realm of Scotland, but rather to defend it, by promoting an union of the two kingdoms, on fair and honourable terms, by virtue of the marriage, to which the Scottish parliament had agreed in the most solemn manner. He pointed out the advantages that would accrue to Scotland from such a match. He proposed, that if all the nobility of the kingdom were not inclined to a peace on such terms, hostilities should cease until the queen should be of age to choose for herself. The regent communicated these honourable proposals to his brother John, archbishop of St. Andrews, and a few other individuals, who being elated with the hope of victory, advised him to conceal them from the rest of the nobility, and in the mean time diffused a report through the whole army, that the English were come to carry off the queen, and enslave the country. The soldiers believed this insinuation, and took to their arms in a tumultuous manner. Understanding that the English were in motion, they passed the river Esk, and took possession of a rising ground, while the protector wheeled about and encamped upon the hill of Pinkencleuch, near the side of the Frith, where their fleet lay at anchor. The enemy imagining he intended to re-embark, quitted their advantageous ground in order to attack; and this precipitate step was the cause of their destruction. The English began to be in want of provision, and had the Scots maintained their post, the protector could not have retreated without exposing his army to the most imminent danger. But the impetuosity of the enemy saved them the risk of any such disaster. On the 10th day of September they divided their forces into three bodies. The first, under the command of the earl of Angus, was flanked on the right with four or five pieces of artillery, and on the left with four hundred horsemen. The second

line was commanded by the regent. The third by the earl of Argyle, who had brought into the field four hundred highlanders; and these were disposed on the left flanks of the second and third bodies. The protector seeing them abandon their posts, congratulated himself on the event, and caused his army to be drawn up in order of battle. The van was commanded by the earl of Warwick, and took post on the side of the hill, where the great artillery was posted. The main body, under the general, was drawn up partly on the hill, and partly on the plain, and the rear was extended on the plain at some distance from the van and center. The lord Grey, who commanded the men at arms, was posted at the left wing, so as to flank the Scots, but forbidden to charge until the front of both armies should be engaged. The enemy advancing along shore, were galled from an English galley, the shot of which killed the lord Graham, and threw the highlanders into confusion. The lord Gray perceiving their disorder, advanced immediately to charge the enemy's van in flank, but met with such a warm reception from their spearmen, that he himself was dangerously wounded, and as the action happened in broken ground, his men at arms were actually routed, and the standard in great danger of being lost. Had the Scots been furnished with horse to pursue this advantage, in all probability the English would have been entirely defeated, though the wind and sun were full in the faces of the enemy; but as they were destitute of cavalry, the lord Gray had time to rally his horse behind his infantry. The earl of Warwick detached Sir Peter Mewcas and Peter Gamboa, a Spanish officer, with all the musketry, to attack the Scots, whose highland archers were not yet come up. The English musketry advancing to a slough, where the horse had been discomfited, fired in the faces of the enemy. These were sustained by the archers, who shot their arrows over the heads of the musketeers, and at the same time the artillery planted on the hill on the left, and the ordnance of the galley anchored close to the shore on the left, made such havoc amongst them, that they fell in heaps, without having it in their power to annoy their enemies. In this distress their van fell back a little, in hope of drawing the English over the slough and broken ground, that they might have an opportunity of acting hand to hand:
but

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but the highlanders in the second line imagining their front was defeated, betook themselves to flight in a body, and this circumstance overwhelmed their whole army with consternation. Disorder and rout immediately ensued. The Scots threw down their arms, and fled in the utmost confusion. Then the English cavalry being rallied, fell in upon the fugitives, and meeting with no resistance, made such a terrible carnage, that they lay like sheep in a field of pasture. The whole surface of the ground was strewn with spears and swords. The river Esk and several petty brooks were swelled with the blood of the slain, which amounted to fourteen thousand, inasmuch that when the slaughter was over, the very soldiers were astonished at their own cruelty, for the English did not lose above fifty horsemen, and their infantry did not strike a stroke. About three thousand ecclesiastics, who had made a separate body for themselves, were massacred without mercy. One thousand five hundred of the vanquished were taken prisoners, and among these the earl of Huntly, the lords Yester, Hamilton, and Wemyss, together with the master of Sempil.

MUSTER, in the marine, a summoning together the crew of any particular ship, and calling them severally over by their names.

MUTE, *dumb*, in a general sense, signifies a person that cannot speak, or has not the use of speech.

MUTE, in law, a person that stands dumb or speechless, when he ought to answer, or to plead.

MUTE, in grammar, a letter which yields no sound without the addition of a vowel. The simple consonants are ordinarily distinguished into mutes and liquids, or semi-vowels.

The mutes in the Greek alphabet are nine, three of which, viz. α , κ , τ , are termed *tenues*; three, β , γ , δ , termed *mediae*; and three, ϕ , χ , θ , termed *aspirites*.

The mutes of the Latin alphabet are also nine, viz. B, C, D, G, I, K, P, Q, T.

MUTILATION, the retrenching or cutting away any member of the body. This word is also extended to statues and buildings, where any part is wanting, or the projecture of any member, as a cornice or an impost, is broken off.

MUZZLE of a Gun or Mortar, the extremity at which the powder and ball is

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put in; and hence, the muzzle-ring is the metalline circle, or moulding, that surrounds the mouth of the piece.

MYOLOGY, *Myologia*, a treatise or description of the muscles.

MYOPS, implies a short-sighted, or purblind person, who cannot see objects at a distance but confusedly, and near ones distinctly, which is contradicting distinguished from presbyta. This disorder is owing to the too great convexity of the ball of the eye, and particularly of the crystalline humour; whereby the visual rays concur before they reach the retina. For this reason, to see an object distinctly, they must either apply it close to the eye, or use a concave glass.

MYOSOTIS, mouse-ear, in botany, a genus of plants.

MYOSURUS, mouse-tail, in botany.

MYRIAD, a term sometimes used to denote ten thousand.

MYRIOPHYLLUM, small water-milfoil, in botany.

MYRISTICA, the nutmeg-tree, a genus of trees, the characters of which are not fully ascertained.

MYROBALANS, dried medicinal fruits, of the plum kind, brought from the East-Indies. Five sorts have been distinguished in the shops; but all of them have an unpleasant, bitterish, very austere taste; and strike an inky blackness with solution of chalybeate-vitriol. They are said to have a gently purgative, as well as astringent and corroborating virtue; but in this country they have long been entire strangers to practice, and are now discarded by the colleges both of London and of Edinburgh, from their catalogue of officinals.

MYRRH, in the materia medica, a gummy resinous concrete juice, of an oriental tree, of which we have no certain account. It comes over in glebes or drops, of various colours and magnitudes; the best sort is somewhat transparent, friable, in some degree unctuous to the touch, of an uniform brownish or reddish yellow colour, often streaked internally with whitish semi-circular veins; of a moderately strong, not disagreeable smell; and a lightly pungent, very bitter taste, accompanied with an aromatic flavour, but not sufficient to prevent its being nauseous to the palate.

This bitter aromatic gummy-resin is a warm corroborant, deobstruent, and antiseptic. It is given from a few grains to a scruple and upwards, in uterine obstructions, cachexies, putrid fevers, &c. and

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and often employed also as an external antiseptic and traumatic.

Tinctures of nirth, made by digesting three ounces of the concrete in a quart of rectified or proof spirit, are kept in the shops, and given sometimes internally from fifteen drops to a tea-spoonful, but oftener used among us externally for cleansing ulcers and promoting the exfoliation of carious bones; both tinctures are of a reddish yellow colour.

MYRTIFORM, in anatomy, an appellation given to several parts, from their resembling myrtle-berries.

MYRTLE, in botany, an ever-green shrub, with oblong leaves, pointed at both ends. It is a native of the southern parts of Europe, from whence the shops have been usually supplied with the berries, called myrtilli, which rarely come to perfection in our climate; nor does the shrub bear our severe winters without shelter. The berries of the myrtle, recommended in alvine and uterine fluxes and other disorders from relaxation and debility, appear to be among the mild restringents or corroborants: they have a roughish not unpleasant taste, accompanied with a degree of sweetness and aromatic flavour. The leaves have likewise a manifest astringency, and yield, when rubbed, a pretty strong aromatic smell, agreeable to most people. There are several species of this plant, however, preserved in our gardens; they are all easily propagated from cuttings. The best season for this is July, and the straightest and youngest vigorous shoots are to be chosen.

MYSTERY, something secret or concealed, impossible or difficult to comprehend. All religions, true or false, have their mysteries. The pagan religion was remarkably full of them. Ovid reckons it a great crime to divulge the mystic rites Ceres and Juno. Tho eleusinia, or sacred rites of Ceres, solemnized at Eleusis, were called, by way of eminence, the Mysteries; and so superstitiously careful were they to conceal these sacred rites, that if any person divulged any part of them, he was thought to have called down some divine judgment on his head, and it was accounted unsafe to abide under the same roof with him; and Horace declares, that he would not put to sea in the same ship with one who revealed the mysteries of Ceres. The pagan mysteries, it is true, were generally mysteries of iniquity, and concealed only because their

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being published would have rendered their religion ridiculous and odious. Thus the sacred writings often speak of the infamous mysteries of the pagan deities, in which the most shameful crimes were committed under the specious veil of religion.

The whole religion of the Egyptians was mysterious from the beginning to the end, and both their doctrine and worship wrapped up in symbols and hieroglyphics.

The religion of the Jews is supposed to be full of mysteries. The whole nation, according to St. Augustin, was a mystery, as it represented or was a type of the people of Christ, and the Christian religion. Whatever was commanded or forbidden them was figurative, and their sacrifices, priesthood, &c. included mysteries. The prophecies concerning Jesus Christ in the Jewish books, are likewise figurative and mysterious.

The Christian religion has also its mysteries; but in the Scripture language the word mystery is used with some latitude, and denotes whatever is not to be known without a divine revelation, and all the secret things which God has discovered by his ministers the prophets, by Jesus Christ and his apostles. The mysteries of the Christian church are, the incarnation of the word, the hypostatical union of the divine and human nature, the miraculous birth, death, and resurrection of the son of God, the doctrine of the trinity, &c.

St. Paul often speaks of the mysteries of the Christian religion; as the mystery of the gospel, the mystery of the cross of Christ, the mystery which was kept secret since the world began; and he calls the preachers of the gospel, the stewards of the mysteries of God.

MYSTICAL, something mysterious or allegorical.

MYSTICS, a religious sect, distinguished by their professing a pure, sublime, and perfect devotion, with an entire disinterested love of God, free from all selfish considerations, and by their aspiring to a state of passive contemplation.

MYTHOLOGY, μυθολογια, the history of the fabulous gods and heroes of antiquity, with the explanations of the mysteries or allegories couched therein. Lord Bacon thinks that a great deal of concealed instruction and allegory was originally intended in most part of the ancient mythology.

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N, A liquid consonant, and the thirteenth letter of the Greek, Latin, English, &c. alphabets.

It is formed from the old Greek, and that from the old Hebrew nun. It suffers no consonant immediately after it in the beginning of words or syllables; nor any before it but *g*, *k*, and *j*, as *gnaw*, *know*, *snore*, &c.

As a numeral, N stands for 900; and with a dash over it, thus $\overline{N}$, for 9000.

NABOB, a viceroy, or governor of one of the provinces of the mogul's empire, in India.

NABONASSAR, or *Era of NABONASSAR*, a method of computing time from the commencement of Nabonassar's reign.

The epocha of Nabonassar is of the greater importance, as Ptolemy and other astronomers account their years from it.

NADAB, the sovereign pontiff, or high priest of the Persians, whose dignity is the same as that of the musti among the Turks; with this difference only, that the nadab may divest himself of his ecclesiastical office, and pass to civil employments, which the musti cannot.

NADIR, in astronomy, that point of the heavens which is diametrically opposite to the zenith, or point directly over our heads.

The zenith and nadir are the two poles of the horizon.

* NÆNIA, in pagan worship, a goddess supposed to preside over the melancholy performances sung at funerals, in honour of the dead, to flutes and other instruments, by women who are hired for that purpose. These funeral songs, says Horace, were first invented by Simonides, a Greek lyric poet, and called Næniæ, from the name of the goddess who presided over them. The flutes at the funerals of both Greeks and Romans, were not only used to accompany the voice of those who sung the Næniæ, but to point out the exact time when the assistants were to strike their breasts, in token of their sorrow, which was to be performed in cadence with the music.

NAHUM, or the *Prophecy of NAHUM*, a canonical book of the Old Testament.

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Nahum, the seventh of the twelve lesser prophets, was a native of Elkoshai, a small village of Galilee. The subject of his prophecy is the destruction of Nineveh, which he describes in the most lively and pathetic manner. His style is bold and figurative. This prophecy was verified at the siege of that city by Assyages, in the year of the world 3378, 662 years before Christ. The time of Nahum's death is unknown; the Greek menologies, and the Latin martyrologies, place his festival on the first of December.

NAIADS, in mythology, the nymphs of the fountains.

NAIANT, in heraldry, a term used in blazoning fishes, when in an horizontal posture, as if swimming.

NAIL, *Unguis*, in the animal body, a kind of horny substance growing over the ends of the fingers and toes of men, women, &c. much of the same nature with horn or the hoofs of beasts. The nails are looked upon by some as productions of the cutaneous papillæ, and by others as a continuation of the epidermis. There are three parts generally distinguished in the nails, namely, the root, body, and extremity. The root is white, and like a crescent, and the greatest part of it hid under the semi-lunar fold. The body of the nail is naturally arched, transparent, and of the colour of the cutaneous papillæ that lie under it. The extremity of the nail does not adhere to any thing, and grows as often as it is cut. The principal use of the nails is to strengthen the ends of the fingers and toes, and to hinder them from being inverted towards the convex side of the hand or foot, when we handle or press upon any thing hard; so that they serve rather for buttresses than shields. *Wings.*—The Chinese doctors pique themselves on the excessive length of their nails; some of them, according to Le Compte, being near as long as their fingers.

NAIL, a measure of length, containing the sixteenth part of a yard.

NAILS, in building, &c. small spikes of iron, brass, &c. which being driven into wood, serve to bind several pieces together, or to fasten something upon them.

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them. The several sorts of nails are very numerous; as 1. Back and bottom nails; which are made with flat shanks to hold fast, and not open the wood. 2. Clamp-nails for fastening the clamps in building, &c. 3. Clasp-nails, whose heads clasping and sticking into the wood, render the work smooth, so as to admit a plane over it. 4. Clench-nails, used by boat and barge builders, and proper for any boarded buildings that are to be taken down; because they will drive without splitting the wood, and draw without breaking; of these there are many sorts. 5. Clout-nails, for nailing on clouts to axle trees. 6. Deck-nails, for fastening of decks in ships, doubling of shipping, and floors laid with planks. 7. Dog-nails, for fastening of hinges on doors, &c. 8. Flat-points, much used in shipping, and are proper where there is occasion to draw and hold fast, and no convenience of clenching. 9. Jobent nails, for nailing thin plates of iron to wood, as small hinges on cup-board-doors, &c. 10. Lead-nails, for nailing lead, leather, and canvas to hard wood. 11. Port-nails, for nailing hinges to the ports of ships. 12. Pound-nails, which are four-square, and are much used in Essex, Norfolk, and Suffolk, and scarce any where else, except for paling. 13. Ribbing-nails, principally used in ship-building, for fastening the ribs of ships in their places. 14. Rose-nails, which are drawn four-square in the shank, and commonly in a round tool, as all common two-penny nails are; in some countries all the larger sort of nails are made of this shape. 15. Rother-nails, which have a full head, and are chiefly used in fastening rother-irons to ships. 16. Round-head nails, for fastening on hinges, or for any other use where a neat head is required; these are of several sorts. 17. Scupper-nails, which have a broad head, and are used for fastening leather and canvas to wood. 18. Sharp-nails; these have sharp points and flat shanks, and are much used, especially in the West-Indies, for nailing soft wood. 19. Sheathing nails, for fastening sheathing-boards to ships. 20. Square-nails, which are used for hard wood, and nailing up wall-furniture. 21. Tacks, the smallest of which serve to fasten paper to wood; the middling for wool-cards, &c. and the larger for upholsterers and pumps. Nails are said to be toughened when too brittle, by heating them in a fire-shovel, and putting some tallow or grease among them.

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Nails are sold at six score to the hundred; in lathing, 500 are usually allowed to a bundle of five feet laths, and 600 to a bundle of four feet laths: in flooring, 200 are sufficient for a square of flooring.

NAISSANT, in heraldry, is applied to any animal issuing out of the midst of some ordinary, and shewing only his head, shoulders, fore-feet and legs, with the tip of his tail; the rest of his body being hid in the shield, or some charge upon it; in which it differs from issuant, which denotes a living creature arising out of the bottom of any ordinary or charge.

NAME, *Nomen*, a word whereby men have agreed to express some idea; or which serves to signify a thing or subject spoken of. Names are either proper or appellative. Proper names are those which represent some individual thing or person, in order to distinguish it from all other things of the same species. Proper names are either called Christian, as that given us at baptism, or surnames; the first imposed for the distinction of persons, answering to the Roman *præ-nomen*; the second for the distinction of families, answering to the *nomen* of the Romans, and the patronymicum of the Greeks. Appellative, or general names, are those which signify common ideas, or which are common to several individuals of the same species, as a horse, animal, fish, &c.

* NAMUR, a large city of the Netherlands, and capital of the county of Namur, seated at the confluence of the rivers Maese and Sambre, between two mountains, and defended by a strong castle, seated on a craggy rock. The castle, and its fortifications, occupy as much space as the city itself. In 1692, the French besieged and took it, in six days, after the trenches were opened; but it was retaken by king William in 1695, in sight of an army of one hundred thousand French, though there were sixty thousand men in garrison. At length it was ceded to the house of Austria, by the treaty of Utrecht, in 1713. It was taken by the French in 1746, but was given up after the treaty of Aix la Chapelle. The cathedral church is an old building, with a chapter, consisting of twenty canons, and is a bishop's see. There are here six convents for men, and seven for women. It is 12 miles south-west of Hui, 32 south-east of Brussels, and 150 north-east of Paris. Long. 4. 51. E. Lat. 50. 22. N.

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* **NAMUR**, (siege of.) This town having proved itself so remarkably strong in the two foregoing sieges, that it was never attempted by the duke of Marlborough. But the French general, marshal count de Saxe, in 1746, determined to outdo the duke of Marlborough, by laying siege to this important place. The duke of Cumberland being in England, prince Charles of Lorraine assumed the command of the confederate army. July 4. at Terheyde: the Hessian troops from Scotland, and a reinforcement of Austrians, under count Palfy, had now augmented this army to eighty-seven thousand men. The confederate generals guessed at the marshal Saxe's design, and therefore marched into the neighbourhood of Namur, to cover that place from any attacks which the marshal might make. On the 18th of July, they were in sight of the French army, which exceeded one hundred thousand men, encamped at Gemblours, ten miles north-west from Namur. The marshal did not chuse to attack the confederates till he had gained possession of Namur, he first seized Dinant, by which he made himself master of the Maese above Namur: then Huy, which, on account of its convenient situation, was of great advantage to him. The loss to the allies on this occasion was considerable, their grand magazine was taken in Huy, and their communication cut off with Maastricht. One would think the allies were in a lethargic insatiation, to suffer themselves to be surprized in this manner, and what is still more inexcusable, they suffered marshal Saxe, by his position, to deprive them of all kinds of subsistence, which obliged prince Charles of Lorraine to quit his advantageous post, and abandon Namur to its own strength. Namur was invested immediately by thirty five thousand men, under the command of count de Clermont. The garrison consisted of 7000 Austrians, who made a vigorous defence; but a continual shower of bombs made such dreadful havock in the city, that in a few days it was converted into a heap of rubbish. However, the garrison held out till the 23d of September, after a siege of twenty-one days. The French are said to have gained this acquisition at the expence of 4000 men's lives: the French king ordered Te Deum to be sung throughout all his kingdom, for the rapid conquest of Namur; his ministers affirmed that their troops were no longer sensible of the

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lengths to which sieges were carried in former reigns, and that the surrender of Namur was the fruit of a campaign, where valour, capacity, and prudence, conquered the enemy, without fighting them. During the siege of Namur, the allied army encamped at Maastricht, where they were joined by Sir John Ligonier with some British and Bavarian battalions; upon which the prince resolved to give the enemy battle: with this view he passed the Maese, on the 13th day of September, and advanced towards marshal Saxe, whom he found so advantageously posted at Tongres, that he thought proper to march back again.

* **NANKIN**, a city of China, the capital of the province of Nanking, is about sixteen miles in circumference, and three miles from a great river, from which there are several canals which enter the town. The plan of Nankin is irregular; this arises from the nature of the ground, which is very uneven and hilly. It was formerly the Imperial city, and had a magnificent palace and observatory, now quite demolished. There were superb temples, stately monuments, and public buildings, which are also gone to decay; most of them having been destroyed by the Tartars. About a third part of this city is quite desolate; the streets are narrow, but handsome, well paved, and bordered with neat shops, richly furnished. Here are now very few public buildings worth mentioning, except the gates, a few idol temples, and the celebrated tower of China-ware, which is 200 feet high, and consists of nine stories. This city had formerly a very fine harbour; but at present the mouth is almost stopped up. It is above 600 miles from Peking. Longitude 118. 35. E. Latitude 32. 7. N.

* **NANTES**, an ancient, rich city of France, in Brittany, with a bishop's see, an university, and a mint. It is one of the most considerable places in the kingdom, and contains the richest merchants; it was formerly the residence of the dukes of Brittany, where they built a very strong castle on the side of the river, and it is well fortified. There are here several parishes and religious houses, and the cathedral contains the tombs of the ancient dukes. There are here several fine bridges over the river Loire, which is navigable. The suburbs are so large, that they exceed the city. The Spaniards trade here with wine, fine wool, iron, silk, oil, oranges, and lemons, and carry back cloth, stuffs, corn, and hard-ware.

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The Dutch send salt-fish, and all sorts of spices; and in return have wine and brandy. The Swedes bring copper, and the English lead, tin, and pit-coal. It was here that Henry IV. promulgated the famous edict of Nantes, in 1598, and which was revoked in 1685. It is 37 miles south-west of Angiers, and 217 south-west of Paris. Long. 1. 31. W. Lat. 47. 13 N.

NAPE, a name used for the hind-part of the neck.

NAPHTHA, in natural history, a fluid mineral body, of a thin consistence, bright and pellucid, of a strong smell very readily inflammable, and when pure, burning away, without leaving any residuum. The naphtha is found in considerable quantities floating on the water of certain springs, principally breaking out at the sides of hills in Persia, Tartary, and some parts of the empire of China, where if a lighted candle be held near the surface, it takes fire and over-spreads the surface of the water for a great extent, with a strong white flame, and emits a very disagreeable smell. The genuine naphtha is very rare in Europe; it is not known to be any where naturally produced here, and what we see of it is generally sophisticated.

The medicinal virtues of the naphtha are the same with the common petroleum, but in a more remiss degree. It is used externally on many occasions in Persia; and is taken inwardly, a few drops for a dose, in colics. The principal use made of it, however, is burning in lamps; for which purpose it is very proper.

* **NAPLES**, (kingdom of,) a country formerly known by the name of Great Greece, and takes up the south part of Italy, and represents in shape the lower part of a boot. It is a peninsula, having the gulph of Venice to the north, the sea of Greece to the east, and the sea of Naples to the west. It is one of the finest parts of Italy; and has undergone many changes: the Normans became masters of it in the eleventh century; and the sovereigns were called counts, then dukes, and afterwards kings of Puglia; but in 1282, Peter III. king of Arragon, caused all the Normans to be massacred; and this massacre was called the Sicilian vespers. After this Puglia was joined to Sicily, whence the sovereigns have had the title of king of the two Sicilies for near three hundred years past. It has been called the kingdom of Naples, from the city of that name,

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which is the capital. The French entered it again in the year 1504, but were driven away, and then it came under the dominion of Spain; but the archduke Charles, afterwards the emperor Charles VI. got possession of it in 1706. In 1736 it was given to Don Carlos, by the treaty of Vienna, who was lately in possession of it, but is now king of Spain, and was succeeded by his second son. This kingdom is a fief of the church, and the king pays the pope a purse of seventy thousand crowns of gold, and a white palfrey, annually. It is about two hundred and fifty miles in length, and seventy in breadth. The Apennine mountains cross the whole country from east to west, and divide it into two parts. The soil contains a considerable mixture of sulphur, of which there are many mines, and several volcanos. The heat of the country is greatly owing to this; and for this reason the fruits become perfectly ripe. These are oranges, lemons, citrons, pomgranates, almonds, dates, capers, bay-berries, and figs. They have also sugar, aniseed, pepper, and manna. The wine produced here is excellent; the best of which is called lachrymæ Christi. This country is not less rich in flax, hemp, cotton, olive oil, honey, wax, iron, and alum; likewise deer, fish, and fowl, are very common. As this kingdom has been peopled by different nations, the Neopolitans have not only the vices of the original natives, but those of several other foreign nations. Those who live in the country are fond of hunting; but those in the cities pass their time in going to shews and spectacles. The ladies are greatly addicted to gallantry; and though their husbands are jealous, they find means to deceive them. The common people are much inclined to knavery and theft. The Jews were banished out of this kingdom till the reign of Charles V. but in 1740, the late king allowed them to enter it again for the sake of trade; however, in 1743, and 1744, a terrible plague happening, the churchmen persuaded the king, it was on account of the Jews, and they were again expelled the kingdom. Naples is divided into four large provinces, namely Terra di Lavoro, Abruzzo, Puglia, and Calabria, which are all subdivided into several districts.

* **NAPLES**, a large city of Italy, and capital of a kingdom of the same name. Its situation is extremely agreeable; and if Italy may be called the garden of the

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world, Naples may certainly be called the garden of Italy. This city is very populous, containing about three hundred thousand inhabitants. The circumference of the walls is not above seven miles; but the grandeur, beauty, and magnificence of the suburbs, is astonishing. The Mediteranean or Tuscan sea washes the walls of Naples on the south. The other side of the city is beset with mountains and fruitful hills, which defend it from the injuries of the weather, shelter it from the winds, and supply it with excellent water. Besides it is defended by a high castle called St. Elmo, cut out of a rock on the top of a mountain to the west of the city. The new castle is one of the most considerable fortresses of the city, where there is always a good garrison. Near the castle is a tower, wherein the masters of families imprison their disobedient sons. Near this is the haven, and a little farther the royal palace, which is one of the finest and most magnificent in all Italy. Near the dock where the galleys are built there is an arsenal, wherein all the necessaries for sea armaments are kept. The third fortress of Naples is the Castle d'Ovo, or the castle of the Egg; it is built on a rock, surrounded by the sea, and the way to it is over a bridge two hundred paces long. It is well furnished with cannon, and has a strong garrison. The harbour is large and well kept, and is secured with a well built mole, which advances into the sea like a half moon. The houses of this city are built of stone, lofty, uniform, and generally in the modern taste; the roofs are flat, and surrounded with balustrades, on which the inhabitants divert themselves on summer evenings. There is scarce a great family in the kingdom but has a palace in this city, there are many large handsome squares, with abundance of fountains of extraordinary size and beauty; among which are three of remarkable magnificence, which are supplied with water from a spring at the foot of mount Vesuvius. They have a great number of churches and convents, of excellent structure, adorned with a vast variety of curious pictures. In general, there is said to be one hundred and twenty convents of men, forty of women, and three hundred churches. The cathedral church dedicated to St. Januarius is a magnificent old structure, remarkable for a little modern chapel, esteemed one of the finest in Europe. The church of St. Mary della

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Annunciata is also a very beautiful structure, and the hospital which belongs to it has an income of two hundred thousand crowns a year, and maintains two thousand infirm people, and eight hundred orphans. Naples is an archbishop's see, and has an university. The commerce of Naples chiefly consists in soap, snuff, wine, silk, silk-waistcoats, stockings, and corn. It is seated on the sea side, one hundred and twenty miles south-east of Rome, two hundred and twenty-five south-east of Florence, and three hundred south of Venice. Long. 14. 45. E. Lat. 41. 51. N.

NARCISSUS, the daffodil, in botany. The root of this plant is emetic, vulnerary, and detergent.

* **NARCISSUS**, in fabulous history, the son of the river Cephissus, and Liriope, daughter of Oceanus. He was a youth of great beauty. Tiresias foretold that he should live till he saw himself. He despised all the nymphs of the country, and made Echo languish, till she became a mere sound, by refusing to return her passion; but one day returning weary and fatigued from the chase, he stopped on the bank of a fountain, to quench his thirst, when seeing his own form in the water, he became so enamoured with the shadowy image, that he languished till he died: on which, the gods changed him into the flower which bears his name.

NARCOTICS, in medicine, opiates, or medicines which excite sleep.

Though much mischief and danger may be the natural effects of narcotics, so that they may be esteemed not far removed from the nature of poisons; physicians, however, have at all times experienced great benefit from hypnotic anodynes, especially in violent pains and fluxes; for what greater benefit can we receive than to be delivered from intolerable pains? Besides, such is the nature of pain, that, if it be of any long continuance, it either weakens the powers of the mind and body to such a degree, as to render a disease, otherwise favourable, eventually mortal, or else brings death of itself. In disorders of the stomach and intestines, all things which induce a stupor, are very cautiously, if at all to be exhibited, because no kind of medicines is so pernicious and injurious to the tone and motions of the nervous parts. To preserve health and prevent diseases, nothing is so effectual, as to retain the tone, strength, and motion of what they call the *primæ*

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primæ viæ, or first passages, because that most salutary excretion which is performed by stool, and discharges the *sordes*, which are the recrements remaining after digestion, or are collected from all parts of the body, depends chiefly thereon. Where this evacuation is wholly suppressed, or performed after a slow and remiss manner, a deluge of viscous humours is soon collected, and becomes the cause as well as the fomentor of diseases. There is nothing which so effectually diminishes the peristaltic motion of the intestines, and suppresses intestinal excretion, as sudatives and anodynes. It is very dangerous to administer opiates and anodynes where the stomach and intestines are inclining to an inflammation and spasmus, or where an extraordinary impurity of the humours disposes them to a corruption.

NARDUS CELTICA, Celtic nard, in botany, a small species of valerian, with uncut, oblong, obtuse, somewhat oval leaves. It is a native of the Alps, from whence the shops have been generally supplied with the dried roots, consisting of a number of blackish fibres, with the lower parts of the stalks adhering; which last are covered with thin yellow scales, the remains of the withered leaves. This root has been recommended as a stomachic, carminative, and diuretic; at present it is scarcely otherwise made use of, in this country, than as an ingredient in mithridate and theriaca, though its sensible qualities promise some considerable medicinal powers.

NARDUS INDICA, Indian nard, or spikenard, in botany, the bushy top of the root, or the remains of the withered stalks and ribs of the leaves of an Indian grassy-leaved plant, of which we have no particular description. The nard, as brought to us, is a congeries of small tough reddish brown fibres, cohering close together, but not interwoven, so as to form a bunch or spike about the size of a finger; sometimes two or three bunches issue from one head, and sometimes bits of leaves and stalks in substance are found among them.

The Indian nard, now kept in the shops chiefly as an ingredient in mithridate and theriaca, was formerly employed in the same intentions as the Celtic, and is said to be used among the Orientals as a spice. It is moderately warm and pungent, accompanied with a flavour not disagreeable.

NARRATION, in oratory and his-

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tory, a recital or rehearsal of a fact as it happened, or when it is supposed to have happened.

NARRATION, in poetry, the action, or event, that makes the subject of an epic poem.

NARWAL, in ichthyology, the unicorn fish, so called from a long wreathed tooth; though it be really a tooth fixed in the gomphosis of the upper-jaw, altogether in the manner of other teeth.

The narwal is a fish of the whale kind, often growing to twenty-five feet in length, but is more commonly found from sixteen to twenty.

* **NASEBY**, (battle at.) In the year 1645, being the time of the grand rebellion; this battle was fought between Charles I. and his parliament. The king marched to Leicester, took that town by assault, and Fairfax followed the same route, in order to give him battle, the two houses having, at the desire of their general, dispensed with the attendance of Cromwell, who thus preserved his command in their army, notwithstanding the self-denying ordinance. Charles, being informed that Fairfax was ordered to besiege Oxford, advanced towards Harborough, where he received intelligence, that he had abandoned his design upon Oxford, and had been repulsed in assaulting the castle of Borsal. The king continued his march, in expectation of being joined by colonel Gerard, with 2000 men, from Wales, as well as by lord Goring, at the head of 3000 cavalry. This officer had wrote to him from Taunton, giving him hopes of reducing that place, and advising him to act on the defensive, till he should join the army; but the letter fell into the hands of Fairfax, who thus apprized, resolved to hazard an engagement before the junction could be effected. For this purpose he followed the royalists; and the king, seeing it would be impossible to reach Leicester, without exposing his rear to certain destruction, determined to meet him half way. He accordingly marched back, and on the 14th day of June, came in sight of the enemy, who were drawn up in order of battle, on a rising ground, near Naseby. Prince Rupert led the right of the royalists; the left was under the direction of Sir Marmaduke Langdale: lord Astley commanded the main body, consisting of all the infantry, and the king headed the body of reserve. The cavalry on the enemy's right, was commanded by Cromwell; the left by his

His son-in-law Ireton; while Fairfax and Skippon, conducted the centre. Prince Rupert attacked the left wing with his usual impetuosity and success; they were pursued as far as the village; but the prince, in his return, mispent his time in a fruitless attempt to seize their park of artillery. Cromwell in the mean time, was furiously engaged with Sir Marmaduke Langdale, whose horse were broken, after a very obstinate dispute. The infantry on both sides maintained the conflict with equal valour for some time, but in spite of Fairfax and Skippon, their battalions began to give way, when Cromwell returned, and charged the king's infantry in flank with such vigour, as they could not resist, so that they were immediately routed and dispersed. By this time prince Rupert had rejoined the king, and the small body of the reserve; but his troops, though victorious, could not be brought to a second charge. They were at all times licentious and ungovernable, but here they were intimidated; for Fairfax, Skippon, and Cromwell, had by this time reduced their forces into order of battle, and stood ready for either attack or defence. The king would have charged them at the head of his reserve, even before Rupert returned, had he not been prevented by an uncommon incident. The Scottish earl of Carnwath, who rode by his majesty's side, seizing the bridle of his horse, turned him round, saying, with a loud oath, "Will you go upon your death in an instant." The troops seeing this motion, wheeled to the right, and rode off in such confusion, that they could not be rallied during the whole action. The king perceiving the fortune of the day irretrievably lost, was obliged to abandon the victory to his enemies, who took all his cannon, baggage, and about five thousand prisoners. Among other things which fell into their hands, was a casket, containing his private letters to the queen, some of which were published. We cannot omit observing, that such an air of tenderness runs through this correspondence, between Charles and his consort, as must impress every impartial reader with a very favourable idea of conjugal affection.

NATIES, in anatomy, a term expressing those two fleshy exterior parts of the body, vulgarly called the buttocks.

NATIES CEREBRI, two circular protuberances of the brain, situated on the back side of the medulla-oblongata, near the cerebellum.

NATION, a collective term, used for a considerable people inhabiting a certain extent of land, confined within fixed limits, and under the same government.

NATIVE, a person considered as born in a certain place or country which was the proper residence of his parents, and where he received his education.

NATIVITY, or *Natal Day*, the day of a person's birth. The word nativity is chiefly used in speaking of the saints, as the nativity of St. John the Baptist, &c. But when we say the Nativity, it is understood of that of Jesus Christ, or the feast of Christmas.

NATIVITY, in astrology, the situation of the heavens, and particularly of the twelve houses, at the moment of a person's birth.

NATRON, or *Mineral Fixed Alkaline Salt*. This salt is contained in great abundance in the waters of the ocean, and makes the basis of the neutral salt so plentifully extracted from them for alimentary uses. It is likewise discoverable in sundry mineral springs, even of those which do not participate of sea-salt; and in some of the eastern countries it is said to be found in considerable quantities on the surface of the earth, sometimes pure, but more commonly blended with various heterogeneous matters, from which it is extracted by means of water. The alkali, called soda, prepared by incinerating the maritime plant kali, or glass wort, contains a salt of the same kind.

NATURAL, in general, something that relates to nature. Natural children are those born out of lawful wedlock.

The natural functions are those actions whereby the aliments are changed and assimilated so as to become a part of the body.

NATURAL HISTORY, a description of the productions of the earth, air, water, &c. The natural history of any one place, is a very extensive subject, which, according to Mr. Boyle, may be conveniently reduced to four heads; viz. the things that regard the heavens, the air, the waters, and the earth. Of the first class are the longitudes, and latitudes of places, the lengths or the longest and shortest days and nights; the climates, parallels, &c. what fixed stars are seen, and what are not seen there. About the air may be observed its temperature, as to the first four qualities, and the measure of them; its weight, clearness, and refractive power; its subtilty or coarseness; its abounding with or wanting an

effusive salt; its variations according to the seasons of the year, and the times of the day; what duration the several kinds of weather usually have; what meteors it is most or least apt to breed; and in what order they are generated, and how long they generally last; what winds it is most subject to; whether any of them are stated or ordinary; what diseases are said to be epidemical, or depending on the state and condition of the air; what other diseases it is subject to, wherein the air may be supposed to have some share; what is the usual salubrity of it, and what sort of constitutions it agrees with, what it does not. See *Air*.

About the waters, it may be proper to observe the sea, its depth, tides, currents, saltness, and other qualities: next the rivers will come under consideration, their depth, length, course, inundation, and the goodness or badness of their waters, with their gravity, and other peculiar qualities; after these the lakes, springs, ponds, &c. are to be considered, especially the mineral waters, their kinds, qualities, and virtues, and the manner of trying them; the inhabitants of the waters may follow here; and the particular kinds of fish that are found there, whether of the sea or rivers, are to be mentioned, with an account of their stores, bigness, goodness, seasons of perfection, haunts, peculiarities of any kind relating to them, and the manner of taking them, especially when there is any thing singular in it.

The things relating to the earth, are last to be examined: these are, first the earth itself, then its inhabitants, and its various productions, whether external or internal. In the earth itself may be observed, its dimension, situation east, west, north, and south; its figure, its plains, and valleys, and their extent; its hills and mountains, and the height of the tallest, both in reference to the neighbouring valleys and plains, and to the level of the sea; as also whether the mountains lie scattered, or are disposed in ridges; and, if of the latter kind, whether they run east, west, north, or south. What promontories also, and what fiery or smoking hills it has, if any; whether the country be coherent or much broken into islands: what the magnetical declination is in several places, and the variation of that declination in the same place, and if those be considerable; what may be conjectured as the occasions of them, whether the vicinity of iron-mines,

of subterranean fires, or what else. What the nature of the soil is, whether clayey, sandy or of good mould; and what vegetables, plants and trees best agree with it and succeed in it what worst. By what particular contrivances the inhabitants improve the advantages, or remedy the disadvantages of the soil; and what hidden qualities the soil may have. The inhabitants of the earth are then to be considered, both natives, and strangers that have been long settled there; and in particular their stature, colour, features, strength, agility or defects of these; and their complexions, hair, beauty, and the like; their diet, inclinations and customs, so far as they are not owing to education; the fruitfulness and barrenness of the women; their hard or easy labours; the diseases they are most subject to, and any remarkable symptoms attending them.

As to the external productions of the earth, the enquires are to be these: what grasses, grains, and fruit it best produces: the herbs, flowers, and timber-trees; and the coppices, groves, forests, and woods the country has or wants: what peculiarities are observable in any of them; what soils they most like or dislike, and with what culture they thrive best. Then what animals the country has or wants, both as to wild beasts and birds of prey, and as to poultry and cattle of all sorts; and particularly if they have any animals that are not common, or any thing particular in those they have. After those, the subterranean stores are to be examined; what minerals the earth affords, and what it wants; then what quarries of stone, and in what manner they lie: what clays and earths are found there; as clays, marles, fuller's earths, earths for tobacco-pipes, earths for potter's wares, medicinal earths; what other mineral productions it yields, whether coals, salt-mines, or salt-springs, alum, vitriol, sulphur, &c. What metals the country yields, with a description of the mines of them; their depths, numbers, situations, signs, waters, damps, quantities of ores, goodness of the ores, and the ways in use for the reducing them to metals.

NATURAL INCLINATIONS, the tendencies of our minds towards things seemingly good.

NATURAL PHILOSOPHY, that which considers the powers and properties of natural bodies, and their mutual actions on each other. The business of natural philosophy, says Boerhaave, is to

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to communicate a solid and accurate knowledge of all the bodies in being, and all the affections thereof. Nor can this science be acquired otherwise than by observing, by means of our senses, all the objects which the author of nature has made cognizable thereto: hence, the first and principal part of this science is to collect all the manifest and sensible appearances of things, and reduce them into a body of natural history. Now there are two ways of making such observations; the first, when we view things nearly as they happen to turn up, without any design or intervention of our own; in which way no great improvements can be expected in the art, because chance having here the direction, only exhibits occasional or extemporary properties: the other method is, when, after a thorough acquaintance with bodies, we apply them to other bodies equally known, diligently attending to the result, and observing whether any thing new arises.

NATURAL, in music, a term variously used: thus natural music is the same with vocal, in opposition to artificial music, or that performed on instruments. A song is also called natural, when its notes move easily and gracefully. Natural harmony is that produced by the natural and essential chord of the mode.

A natural note is used to contradict those flats and sharps that are set at the beginning of a stave; and in such case it must be taken exactly as in the gamut.

NATURALIST, one well versed in the study of nature, and the knowledge of natural bodies, especially in what relates to animals, vegetables, metals, minerals, and stones.

NATURALIZATION, in law, the act of naturalizing an alien, or placing him in the condition of a natural born subject.

NATURALS, *Res Naturales*, among physicians, whatever naturally belongs to an animal, in opposition to non-natural. See *Non Naturals*.

NATURE, *Natura*, according to Mr. Boyle, has eight different significations; it being used, 1. For the author of nature, whom the schoolmen call *Natura Naturans*, being the same with god. 2. By the nature of a thing we sometimes mean its essence; that is, the attributes which make it what it is, whether the thing be corporeal or not; as when we attempt to define the nature of a fluid, of a triangle, &c. 3. Sometimes we con-

found that which a man has by nature,

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with what accrues to him by birth; as when we say that such a man is noble by nature. 4. Sometimes we take nature for an internal principle of motion; as when we say, that a stone by nature falls to the earth. 5. Sometimes we understand by nature the established course of things. 6. Sometimes we take nature for an aggregate of powers belonging to a body, especially a living one; in which sense physicians say, that nature is strong, weak, or spent; or that, in such and such diseases, nature left to herself will perform the cure. 7. Sometimes we use the term nature for the universe, or whole system of the corporeal works of God; as when it is said of a phoenix, or chimera, that there is no such thing in nature. 8. Sometimes too, and that most commonly, we express by the word nature a kind of semi-deity, or other strange kind of being. If, says the philosopher, I were to propose a notion of nature, less ambiguous than those already mentioned, and with regard to which many axioms, relating to that word, may be conveniently understood, I should first distinguish between the universal and the particular nature of things. Universal nature I would define to be the aggregate of the bodies that make up the world, in its present state, considered as a principle; by virtue whereof they act and suffer according to the laws of motion prescribed by the author of all things.

And this makes way for the other subordinate notion; since the particular nature of an individual consists in the general nature, applied to a distinct portion of the universe; or, which is the same thing, it is a particular assemblage of the mechanical properties of matter, as figure, motion, &c.

NAVAL, relating to a ship.

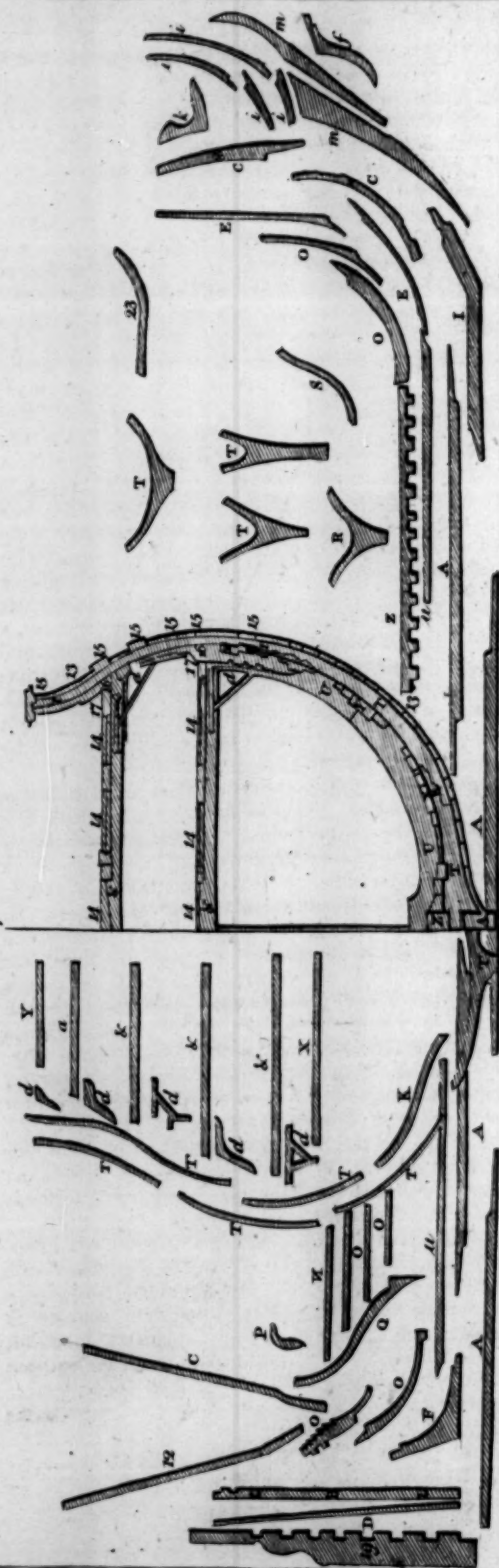
NAVAL ARCHITECTURE, the art of designing the figure, forming the several limbs, and constructing the hull or lower frame of a ship, distinct from the super-structure, which comprehends her machinery and furniture for sailing, which last is explained under the articles *Mast, Sails, and Rigging*.

To whom the world is indebted for the invention of ships is, like all other things of equal antiquity, uncertain: if we listen to the fables of the poets, we shall be extremely divided in our opinion amongst the variety of competitors. Prometheus, Neptune, Janus, Atlas, Hercules, Jason, Danaus, Erythraeus, &c. appear with sufficient authority to claim our assent:

but



Midship Frame.



but Minerva, the auspicious parent of arts and sciences, seems to have a superior title, and to her, probably, with more propriety, it has been attributed by fame. But some who reject these fabulous traditions, and pretend to greater certainty in their allegations, ascribe it to the inhabitants of some places that border on the sea, and seem appropriated by nature for harbouring ships, such as the Phœnicians, Aeginensians, &c. This difference of opinions appears naturally to have risen, on observing the various places where navigation was first practised, or from the different construction and equipage of ships; some of which having been built by the abovementioned persons, have entitled them to the whole invention. A small portion of art or contrivance was seen in the first ships; they were neither strong nor durable, but consisted only of a few planks laid together, without beauty or ornament, and just so compacted as to keep out the water. In some places they were only the hulks or stocks of trees hollowed, and then consisted only of one piece of timber; nor was wood alone applied to this use, but any other buoyant materials, as the Egyptian reed papyrus, or leather, of which the primitive ships were frequently composed; the bottom and sides being extended on a frame of thin battens or scantlings, of flexible wood, or begirt with wickers, such as we have frequently beheld among the American savages ourselves. In this manner they were often navigated upon the rivers of Ethiopia, Egypt, and Sabæan Arabia, even in latter times. But in the first of them, we find no mention of anything but leather or hides sewed together. In a vessel of this kind Dardanus secured his retreat to the country afterwards called Troas, when he was compelled by a terrible deluge, to forsake his former habitation of Samothrace. According to Virgil, Charon's infernal boat was of the same composition. But as the other arts extended their influence, naval architecture likewise began to emerge from the gloom of ignorance and barbarism; and as the ships of those ages were increased in bulk, and better proportioned for commerce the appearance of those floating citadels of unusual form, full of living men, flying with seemingly expanded wings over the surface of the untravelled ocean, struck the ignorant people with terror and astonishment: and hence, as we are told by Aristophanes, arose the fable of Perseus

flying to the Gorgons, who was actually carried thither in a ship. Hence, in all probability, the famous story of Triptolemus riding on a winged dragon is deduced, only because he sailed from Athens, in the time of a great dearth, to a more plentiful country, to supply the necessities of his people. The fiction of the flying horse Pegasus may be joined with these, who, as several mythologists report, was nothing but a ship with sails, and thence said to be the offspring of Neptune, the sovereign of the sea: nor does there appear any other foundation for the story of griffons, or of ships transformed into birds and fishes, which we so often meet with in the ancient poets.

With regard to modern naval architecture, it is necessary to observe here, that it is so complicated, extensive, and various, comprehending such a diversity of structures, that treat the subject at large with accuracy and precision would fill a large volume of itself, and therefore greatly exceed our bounds; and being thus necessitated to contract our description, we shall rest satisfied with giving our readers a general idea of the principles of the art, the necessary qualities of a ship, and a description of the principal members that compose this noble machine, in which we shall decline, as much as possible, to distract their imagination by leading them into a labyrinth of technical terms.

Naval architecture then ought to be reduced to the examination of three different questions; 1. Those which determine the figure of a ship; 2. those which contribute most to her solidity; 3. those which best facilitate her plans; that is, 1. her figure or outward form ought to be suitable to the service for which she is designed; 2. the exact shape of all the pieces of timber necessary to compose such a fabric should be found; 3. convenient apartments should be made for the artillery, ammunition, provisions, and cargo; together with suitable accommodations for the officers and men.

In order to give the bottom a proper figure, all the qualities necessary to make her answer the service for which she is designed should be considered.

A ship of war should carry her lower tier of guns four or five feet out of the water. A ship for the merchant-service should stow her cargo well; and be so fashioned as to go well, carry a good sail, steer easily, and lie in a high sea without straining.

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Some eminent geometricians have endeavoured to discover the form of a solid that will answer all these purposes best, or meet with the least resistance in dividing the fluid through which it is to pass; but have not been able to reduce their theory to practice, on account of the various situations in which a ship is obliged to lie when under sail. The artificers thus despairing to establish this point by mathematical rules, have applied themselves entirely to experience and observation, which may greatly supply the deficiency of art; but though they may discover that a ship has bad qualities, it may be difficult to determine where they lie, or whether they are in the hull or rigging; but if their observations be aided by mathematical principles, it will certainly conduce very much to attain the desired end.

But as many ships have been built, which seem to answer every purpose for which they were calculated, some builders have studied chiefly to copy those which are approved by the seamen; and this method they very improperly regard as the principal rule to be observed in building. Now as the bodies of ships are very different, there are of course variety of different models adopted as standards. But admitting a possibility to discover such a body as should give entire satisfaction, and have every good quality requisite for the service proposed, yet this could by no means be established as a standard for ships of a different size to be copied from, since altho' we may have a first rate of 100 guns, which have been found by experience to be a very good ship in every respect; yet we should be much deceived to build a 20 gun-ship, in which all the parts bore a similar proportion to one another, which they have in the first rate. It has been remarked above, that a ship of war must carry her lowest tier of cannon high enough above the water, otherwise a great ship, which cannot open her lower battery, when sailing with a fresh side wind, may be taken by a small one that can make use of her cannon.

A ship should be duly poised, so as not to dive or pitch heavily, but to go smooth and easy through the water, rising to the waves when they run high, and the ship has reduced her sail to the storm; otherwise they will break aboard, and strain the decks, or carry away the boats: the masts are likewise in great danger from the same cause.

▲ ship should sail well when large and

NAV

before the wind, but chiefly close hauled, or with a side wind, and her sails sharp trimmed, and then not fall off to the leeward.

Now the great difficulty lies in uniting so many different qualities in one ship, which seems to be nearly impossible; the whole art therefore consists in forming the body in such a manner that none of these qualities should be entirely destroyed, and in giving a preference to that which is chiefly required in the particular service for which the vessel is designed; we shall briefly show the possibility of uniting them all in one ship, that each of them may be easily discerned: when it happens otherwise, the fault must lie in the builder, who has not applied himself to study the fundamental rules and principles of his art.

To make a ship carry a good sail. A flat floor-timber, and somewhat long, or the lower-futtock pretty round, a straight upper-futtock, the top timber to throw the breadth out aloft; at any rate to carry her main breadth as high as the lower-deck. Now if the rigging be well adapted to such a body, and the upper-works lightened as much as possible, so that they all concur to lower the center of gravity, there will be no room to doubt of her carrying a good sail.

To make a ship steer well, and answer the helm quickly. If the fashion-pieces be well formed, the tuck, or spreading parts under the stern carried pretty high, the midship-frame well-forward, a considerable difference in the draught of water abaft more than afore a great rake forward, and none abaft, a snug quarter-deck and forecastle, all these will make a ship steer well. A ship which sails well, will certainly steer well.

To make a ship carry her guns well out of the water. A long floor-timber, and not of great rising; a very full midship-frame, and low tuck, with light upper-works.

To make a ship go smoothly through the water without pitching hard. A long keel, a long floor, not to rise too high afore and abaft; but the area or space continued in the fore-body; according to the respective weight they are to carry; all these are necessary to make a ship go smoothly through the water.

To make a ship keep a good wind, and drive little to the leeward. A good length by the keel; not too broad, but pretty deep in the hold, which will occasion her to have a short floor-timber, and a great rising.

As such a ship will meet with great resistance

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resistance in the water going over the broadside, and little when going a-head, she will not fall much to the leeward.

Now some builders imagine it is impossible to make a ship carry her guns well, bear a good sail, and be a prime sailer; because it would require a very full bottom to gain the first two qualities, whereas a sharp ship will answer better for the latter; but when it is considered that a full ship will carry a great deal more sail than a sharp one, a good artist may so form the body, as to have all those three good qualities, and also steer well. After what has been said on this, it certainly cannot be thought impossible to unite all these different qualities in one ship: giving the water a proper curve, ought likewise to be considered, upon which the beauty and stateliness of a ship greatly depend; since it is this which makes a ship look airy and graceful in the water. There is no certain rule for laying them down; this is left entirely to the fancy and taste of the artist, which, as we have more than once observed, is not often of the most delicate degree, or corrected by truth and judgment; witness the barbarous and unnatural mixture of Gothic and Chinese ornaments, "clumsy heroes and fat-headed gods," on the same ship, the monstrous issue of a savage conception and way-ward genius, as deformed and perverse as their own cant-timbers.

As we cannot without greatly exceeding our limits treat particularly of all the pieces that compose a ship, we have here defined all the principle pieces, and laid down each piece separately (plate xxxv.), by which means the length of the scarfs are described, and the manner in which they are joined together.

Explanation of Plate xxxv.

A. The keel, in four pieces, to be firmly bolted together and clinched.

I. The fore-foot, one end of which is scarfed to the fore-end of the keel, of which it is a part, and the other end makes a part of the stem, to which it is scarfed.

u u. Two pieces of dead-wood, one afore and the other abaft, fayed upon the keel.

C. C. The stem in two pieces to be scarfed together: it is the circular piece of timber where both the sides of the ship unite forward.

E. E. The apron, in two pieces, to be scarfed together, and fayed on the inside of the stem, to support the scarf of the

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stem; for which purpose the scarf of the apron must be clear from that of the stem.

o. The stemson in two pieces, to support the scarf of the apron.

o. The false post, which is fayed to the fore-part of the stern post. Faying is fitting two pieces of wood, so as that one may be joined to the back, or inside of the other, so as to lie close.

B. The stern-post: it is tenanted into the keel, to which it is fastened with a knee; and is that streight piece of timber at the after-end of the ship, into which both the sides are united.

D. The back of the post, which is likewise tenanted into the keel, and securely bolted to the stern-post; the design of it is to give sufficient breadth to the post, which seldom can be procured of a sufficient breadth in one piece.

F. The knee which fastens the post to the keel.

N. The wing-transom. It is fayed across the stern-post, and bolted to the head of it: the fashion-pieces are fastened to the end of it; under this, and parallel to it, is the deck transom.

O O. Two transoms fastened to the stern-post and fashion-pieces, in the same manner as the wing-transom.

P. The transom-knee which fasteneth it to the ship's side.

Q. The fashion-piece, of which there is one on each side: their heels are fastened to the stern-post, at the height of the floor-ribbands, and their heads are fastened to the wing-transom.

T. A floor-timber. It is fayed across the keel, to which it is fastened by a bolt through the middle.

T T T T T. 2d, 3d, 4th futtocks and top timbers. These shew the proper length and scarf of the timbers, in what is called the midship-frame, which is a plane comprehended between the two sides, at their extreme breadth, and the keel to which it is perpendicular; so that if a ship were cut through perpendicular to her length, and at her greatest breadth, the exterior and interior part of both sides from the upper parts or edges, called the gunnels, down to the keel, would exhibit the midship frame. The futtocks are to be joined, to complete a frame of timbers.

U U. Riders. These are fayed on the inside of the ship across the keel, and stand in the same manner as the timbers, and consist of floor and futtock riders.

Z. The kelson: this is made of two

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or three large pieces of timber scarfed together in the same manner as the keel. It is placed over the middle of the floor timber, and scored about an inch and a half down upon each of them.

R, S. Breast-hooks: these are fayed on the inside across the stern, and to the bow on each side of it, to which they are fastened with proper bolts. There are generally four or five in the form of an R in the hold, one in the form of S, into which the lower-deck planks are rabbetted; there is one right under the hawse holes, and another under the second deck.

X, Y, Z. Are thick planks which are fayed to the inside, and stretch fore and aft, or from one end of the ship to the other, to support the scarfing of the timbers.

Z. Are thick planks in the inside called clamps, which sustain the end of the beams.

15, 15, 15, 15, 15. Are the wales: they are planks broader and thicker than the rest, which are fastened to the outside of the ship on a line with the decks: with regard to the planks reaching from the wale upwards to the top of the side, and downwards to the keel, the reader is referred to the section of one half of the midship-frame, as laid down in the plate.

d, d, d, d, d, d, d. Are knees. These are crooked pieces of timber consisting of two arms, which form an angle sometimes acute, and sometimes obtuse or rectangular: their use is to fasten any two pieces together; as the beams to the ship's side, &c.

19. The rudder: this is joined to the stern-post by the rudder-irons, upon which it turns round in the googings, which are fastened upon the stern-post for that purpose. There is a mortise cut through the head of it, into which a long bar is fitted, called the tiller, by which the rudder is turned from one side to the other, and both parts together are called the helm.

23. The cat-heads. These are two large square pieces of timber, one on each side of the bowsprit: they project from the bow over the side, in order to keep the anchor clear of the ship, which is drawn up by a rope called the cat-fall, which passes through certain pulleys, called sheaves, in the outer-end of the cat-head: their inner-ends are fastened upon the fore-castle.

m, m, i, i, i. Are the several pieces

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which compose the knee of the head, called by seamen the cut-water; the lower part m is fayed to the stem, the keel of it is scarfed to the head of the fore-foot; it is fastened to the bows by two knees, called cheeks, and to the stem by a knee called a standard, in the form of a K.

a, X, Y. Are beams, or large pieces of timber which support the planks of each deck. See the article *Beams*. The reader will readily discover that the two sides of the midship frame in the middle of the plate are so disposed, that all the pieces on one side may be seen before they are joined, and on the other after they are fixed in their proper places.

In ships of war the general dimensions are established by the authority of those appointed by the government for that purpose. In the merchants service, the extreme breadth, length of the keel, depth in the hold, and height in the waste, and between decks; and sometimes the height and breadth of the wing-transom, are agreed on by contract: and from these dimensions the builder is to form a draught suitable to the trade for which she is designed.

We refer such readers as wish to be particularly informed of ship-building to M. Du Hamel's curious and useful Elements of Naval Architecture. Mr. Mungo Murray has also published a book on this subject, called a Treatise on Ship-building, &c. which must be of great service to the younger artificers of this profession, as it contains variety of very accurate drawings of ships. An abridgement of M. Du Hamel's book referred to above, is also translated, and annexed to Murray's Treatise.

NAVAL-ARMAMENT, the same with fleet of ships of war, which see.

NAVAL-CAMP, in antiquity, a fortification, consisting of a ditch and parapet on the land-side, or a wall built in the form of a semi-circle, and extended from one point of the sea to another. This was sometimes defended with towers, and beautified with gates, through which they issued forth to attack their enemies. Homer hath left us a remarkable description of the Grecian fortifications of this sort, in the Trojan war, beginning at v. 436. *Iliad* 2.

Towards the sea, or within it, they fixed great pales of wood, like those in their artificial harbours; before these the vessels of burthen were placed in such order, as that they might be instead of a wall,

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wall, and give protection to those within; in which manner Nicias is reported by Thucydides to have encamped himself: but this seems only to have been practised when the enemy was thought superior in strength, and raised great apprehensions of danger in them. When their fortifications were thought strong enough to defend them from the assaults of enemies, it was frequent to drag their ships to shore, which the Greeks called *εὐλακίαν*, the Romans *subducere*. Around the ships the soldiers disposed their tents, as appears every where in Homer; but this seems only to have been practised in winter, when their enemy's fleet was laid up and could not assault them, or in long sieges, and when they lay in no danger from their enemies by sea, as in the Trojan war, where the defenders of Troy never once attempted to encounter the Grecians in a sea-fight. The adjacent places were usually filled with inns, and stews, well stocked with females, that prostituted themselves to the mariners, merchants, and artificers of all sorts, who flocked thither in great numbers; this however appears to be only in times of peace. *Potter's Antiquities of Greece.*

NAVEL ENGAGEMENT, either a sea-fight between single ships or fleets of men of war, or gallees, &c.

The ancients ranged their ships or gallees so far as to present them in front to their enemy; because the machines they then made use of, were fixed in the heads or prows of their vessels: the same reason now prevails with regard to the gallees, which are drawn up in the form of a crescent, or half-moon, whose ends or horns are opposed to the enemy; in the middle of which is the admiral, from whence he the more distinctly observes the motions of his fleet throughout. The two fleets being thus drawn up, approach each other to a convenient distance, when the battle beginning at the ends of the half-moon, extends insensibly till the whole fleet is engaged, and each partakes of the danger and glory of the action.

It is probably the most expedient method, as proved by experience, to keep a constant cannonade on the enemy, by firing in platoons, which will have a much greater effect, and distress them more, than the common received notion of a broad-side and broad-side with some intervals between, which is generally the case in most actions; in order to which,

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it will be most prudent to divide the guns into five fires, in the following manner, viz. half the guns abaft below, then half the guns abaft aloft, so the other half below forward; and, lastly, the quarter-deck guns, and those on the fore-castle: so that, by the time your first platoon is fired, you will be able to keep up a constant fire on your enemy, which method is preferable, as was observed before, to broad-side and broad-side, where chance has often a greater share in the execution than judgment: notwithstanding, this last method is sometimes necessary, as time and circumstances may offer. It is likewise necessary to point your guns so as to make a breach in your enemy's ship. The chief judgment of an admiral, is to form his line in a proper disposition and strength from the van throughout to the rear; in doing which, particular care must be had to make the center strong, for if that be forced, or broke through, the battle is looked upon as lost. Here it is to be observed, that, in a sea-action, the center is made the strongest, whereas in a land-fight it is the weakest; and the wings of an army are strongest, lest the enemy, by forcing a wing, should have the advantage of flanking, and consequently putting the line in disorder: for the same reason also, the van and rear of a fleet is not put into confusion, because care is taken to make them proportionally strong to resist the enemy: therefore the weakest part of the line will be in the quarters, supported each way from the center throughout. The signal being made for battle, every captain crowds immediately into his proper station: they endeavour to approach each other till within point-blank gun shot, which is near enough for a line of battle; for if you should be too near, your line will naturally fall into a curve, notwithstanding all your endeavours to the contrary: besides, you cannot so well observe your own line; the enemy may intercept your sight, especially if the line be long, which may cause a mistake in the signals. It would be better for the contending admirals in chief, that each had a view of his own line, as well as that of the enemy, in order to make proper signals, and, if any distress happen, to be the better able to relieve, or if any advantage, to improve upon it. The battle being begun, the fate of war decides the day. In a word, the success of all depends upon placing your shot well, and preserving a proper disposition in the line. There is

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one maxim, by which we should always be guided, that is, that bravery and resolution are absolutely necessary in the first sort of engagement, viz. between single ships; and conduct and bravery in the second sort, viz. that between two squadrons. Conduct and presence of mind are chiefly requisite in a line of battle; for the admiral cannot be supposed to want bravery and resolution. It is then he must summon up all his knowledge and experience to judge of the strength of his line; when and how to keep it as complete as possible, by ordering ships from the corps-de-reserve, or by changing ships from one part of the line to the other, or by detaching from one part of the wings, which may not be so much pressed, to that which is. Here he must also consider the position of his enemy; his eyes must be on him, as well as on his own line, from the van to the rear; and all should strictly mind the admiral's motion, signals, &c. Boats will, in all probability, be continually passing from the ships to their flag-officers, if any thing extraordinary should happen, to acquaint them of it: and from the admirals, or commanding officers, of each division to the admiral in chief, giving an account of the state and condition of each division, which will be a great satisfaction to him, as he will then be better able to judge how to assist where most wanted when occasion requires, or how to improve upon any advantage gained. The battle drawing to a conclusion, it is easy to judge what the conqueror will do to improve his victory; as necessary a part of an officer as any in the action, as it requires great judgment and readiness of thought; and the other, in making his retreat, should let slip no opportunity to save as many of his fleet as he possibly can. His eye must be quick, and his judgment and presence of mind as ready as at the first onset of the battle. He has no other resource left but in his escape, and this comfortable alleviation of his defeat, that a glorious retreat may gain him as much honour as the victory did to the conqueror. See *Retreat*.

* **NAVARRÉ**, a kingdom of Europe, lying between France and Spain, divided into the Upper and Lower. The Upper Navarre belongs to Spain, and is bounded by the Pyrenean mountains on the east, which parts it from Gascony; by the kingdom of Arragon on the south; by Old Castile on the west; and by Bis-

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cay on the north. It is a mountainous country, but has some fruitful valleys, and abounds in all sorts of game, and mines of iron. The inhabitants are laborious and active. It is divided into five districts, whose capitals are Pampeluna, Stella, Tudella, Olita, and St. Gueca. Lower Navarre belongs to France, and has but one district, the capital of which is St. John Pied de Port. It is separated from Spanish Navarre by the Pyrenean mountains, and is a mountainous barren country. In general, this country is not very rich; however, there are tolerable pastures, and the air is very pure, and not so hot as in the rest of Spain. Navarre had its own kings for seven hundred and ninety-four years; that is, from 718 to 1512, when Ferdinand the Catholic took it from John d'Albret, under pretence of his being excommunicated by the pope.

NAVE, in architecture, the body of a church, where the people are disposed, reaching from the balluster, or rail of the choir, to the chief door.

Some derive the word nave from *navis*, a temple; and others from *navis*, a ship, by reason the vault or roof of a church bears some resemblance to a ship.

NAVEL, *Umbilicus*, in anatomy. See the article *Umbilicus*.

NAVEL-WORT, cotyledon, in botany. See the article *Cotyledon*.

NAVEW, *Napus*, in botany, a plant of the turnip kind, with oblong roots, growing slender from the top to the extremity.

NAVEW, *Napus Sativa*, garden or sweet navew, or French turnip; cultivated for the culinary use of its roots, which are warmer and more grateful than those of the common turnip, and are said to afford likewise, in their decoctions, a liquor beneficial in disorders of the breasts.

NAVEW, *Napus Silvestris*, wild navew or rape, growing on dry banks and among corn, with leaves somewhat different from those of the former, being more those of cabbages than of turnips; the root smaller, and of a stronger unpleasant taste; and the seeds also rather more pungent, on which account they are preferred by the faculty of Paris. The seeds of both kinds yield upon expression a large quantity of oil: the oil called rape-oil is extracted from the seeds of the wild sort, which is cultivated in abundance, for that use, in some parts of England. The cake remaining after the expression of the oil, retains, like that of mustard,

the

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the acrimony of the seeds. See *Rape-
seed*.

NAVIGATION, the theory and art of conducting ships by sea, from one port to another, or of disposing and actuating their machinery, by the force of the wind, so as to begin and continue their motion at sea. Most of those useful arts and admirable inventions which are the very support of mankind, and supply them with all the necessities and conveniences of life, have at first been the production of some lucky chance, or from slight beginnings have been, by long experience, cautious observations, and various improvements, matured and brought to perfection. Instances of this kind are every where frequent and obvious, but none can be produced more remarkable than in the art of navigation, which though now arrived to a pitch of perfection beyond most other arts, was in the beginning so mean and imperfect, that the pleasure or advantage of those who first applied themselves to it was very small and inconsiderable. Those who adventured to commit themselves to the liquid element made their first essays in shallow waters, cautious of trusting themselves at any considerable distance from the shore; but being emboldened by repeated trials, proceeded farther by degrees, till at length they took courage and launched forth into the main ocean. To this purpose Claudian expresses himself in Latin, which we may thus translate :

Who launch'd the first bold vessel on the deep, [sweep ;
And bade his aukward oars the waters
Cautious, adventur'd on the margin-wave
At first ; afraid the distant surge to brave :
Advancing farther, to the powerful gale,
High on the mast he spread the swelling
fail.

Till by degrees he wander'd from the shore,
Unconscious of those fears he felt before ;
And guided by some star's auspicious ray,
His bark undaunted cleav'd the watery
way,

Along the Ægean and Ionian seas.

The heavenly bodies were observed by sailors on a two-fold account, being of use to them in prognosticating the seasons, and as guides to shape their course. The principal of those used in foretelling, were Arcturus, the Dog-star, Aræ, Orion, Hyades, Hædi, Castor and Pollux, Helena, &c. It was likewise customary to take notice of various omens offered

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by sea-fowls, fishes, and divers other things, as the murmuring of the floods, the shaking and buzzing noise of trees in the neighbouring woods, the dashing of the billows against the shore, and many more, in which all good pilots were nicely skilled. As to the direction in their voyage, the first practitioners in the art of navigation, being unacquainted with the rest of the celestial motions, steered all the day by the course of the sun ; at night betaking themselves to some safe harbour, or resting on the shore, and not daring to venture to sea till their guide was risen, to discover their way : that this was their constant custom, may be observed from the ancient descriptions of those times. See Virg. *Æn.* 3. v. 508. *Sol ruit interea, et montes umbrantur opaci*, &c. Afterwards the Phœnicians, called, by some, the first inventors of navigation, discovered the motions of some other stars, as may be observed by Pliny and Propertius. The Phœnicians we find to have been directed by Cynosura, or the lesser bear-star, which was first observed, as some are of opinion, by Thales the Milesian, who was originally a Phœnician, when the mariners of Greece, as well as other nations, steered by the greater bear : for the first observation of this, they were obliged to Nauplius, if we may believe Theon ; or according to the report of Flaccus to Tiphys, the pilot of the famous ship Argo. But of these two we are told by Theon, the former was the securer guide, and therefore was followed by the Phœnicians, who, for skill in marine affairs, outstript not only all the rest of the world, but even the Grecians themselves. That the oars might strike the water, and proceed in a regular and constant motion, keeping due time with each other, they had Τριταυλης, a musician, who, by the harmony of his voice and instrument, not only directed the rowers in their motions to strike uniformly, but raised their spirits when weary with labour and ready to faint, as we read in Statius, *Thebaid*, v. 342.

*Acclinis malo mediis interfrenat Orpheus
Remigis tantosque jubet nescire labores.*

Against the mast the tuneful Orpheus
stands,
Plays to the weary rowers, and commands
The thought or toil away——

After they had invoked the protection
of

of their gods by solemn prayers and sacrifices, which, as they offered to other deities, so more especially to those who had any concern or command in the sea; to the winds and tempests, the whole train of marine gods and goddesses, but, above all to Neptune, they spread sail and put to sea. Nor was it enough for themselves alone to petition the gods for safety and success, but all the multitudes that thronged on these occasions to the shore, earnestly recommended them to the divine protection, and joined their fervent prayers for their deliverance from all the dangers they were going to encounter. Since the great improvement of navigation, these practices have, however, been intirely laid aside by the moderns.

This done, we are told by the Scholiast upon Apollonius, that it was usual to let fly a dove, which no doubt was looked on as an omen of safe return, because that bird is not easily forced to relinquish its habitation, but when driven away delights to return. Then they put to sea, the signal being given by a shout, by sound of trumpet, and several other ways. In the night it was usually given by torches lighted in the admiral-galley.

The ships were usually ranged in this order; in the front went the lighter vessels; after these followed the men of war, led on by the admiral, which was commonly distinguished from the rest by the richness of her ornaments: last of all, the vessels of burden came up. If the winds were high, or the sea dangerous, they were extended at length, sailing one by one; but at other times they went three or more in a breast.

Tyre, the capital of the Phœnicians, whose commerce, riches, and power, are represented in such lofty terms, both in facted and profane authors, being furnished with excellent wood for ship-building, was very soon mistress of a numerous fleet, with which the inhabitants constantly embarking on new expeditions, and settling new trades, they soon arrived at an incredible pitch of opulence and populousness; inasmuch as to be in a condition to send out colonies, the principal of which was that of Carthage; which keeping up the Phœnician spirit of commerce in time it not only equalled Tyre itself, but vastly surpassed it, sending its merchant-fleets through Hercules's pillars, now the straits of Gibraltar, along the western coasts of Africa and Europe, and, if we may believe some authors, to America itself; the dis-

covery whereof, so many ages afterwards, has been so glorious to the Spaniards.

After the destruction of Tyre by Alexander the Great, its navigation and commerce were transferred to Alexandria, a new city, admirably situated for those purposes, and proposed for the capital of the empire of Asia, which Alexander then meditated. And thus arose the navigation of the Egyptians, afterwards so cultivated by the Ptolemies, that Tyre and Carthage, which last, after having a long time disputed empire with the Romans, was at length subdued, were quite forgot.

Egypt being reduced itself into a Roman province, after the battle of Actium, its trade and navigation fell into the hands of Augustus, in whose time Alexandria was only inferior to Rome; and the magazines of the capital of the world were wholly supplied with merchandize from the capital of Egypt.

At length Alexandria itself underwent the fate of Tyre and Carthage; and the fall of Rome and its empire drew along with it not only that of learning and the polite arts, but that of navigation; the Barbarians, into whose hands it fell, contenting themselves with the spoils of the industry of their predecessors.

Navigation thus travelled, together with the polite arts, to the eastward; but it does not appear which of the European nations, after the settlement of their new masters, first betook themselves to navigation and commerce. Some think it began with the French, though the Italians seem to have the justest title to it, and are accordingly looked on as the restorers thereof, as well as the other arts and sciences, which had been banished together, when the empire was torn asunder: but at present the British navy hold an undisputed empire over the main.

NAVIGATION, among the moderns, comprehends either the art of seamanship, or of conducting a ship by the laws of geometry, upon the wide and trackless ocean, or both.

By seamanship we would be understood to comprehend a perfect knowledge, as well of all the various machinery and furniture of a ship, as experience and skill to dispose those machines so judiciously, that by a mutual assistance of each other, they may begin and continue the motions of this complicated frame, according to the different designs which may be required, or the various exigencies

to which it may be reduced. It likewise includes the art of renewing or keeping in repair the instruments and engines employed in all the purposes of navigation.

That part of navigation which regards the piloting or guiding a ship along the coast, can only be acquired by experience, as it chiefly comprehends a knowledge of the reigning winds, the setting of the tides, the different depths of water, and the various sorts of ground discovered in different depths, as shells of many colours, sand great and small, clay, ooze, shingle, gravel, stones, &c. &c. by which the place of the ship may be known many times in the darkest night, and consequently her distance from some known place on the coast. The bearings of the nearest cape, headland, promontory, or island, is always set by the compass, and the distance allowed by computation, which experience and attention often make the seamen very perfect in. See *Coasting*.

That part of navigation by which we understand the direction of a ship's course at sea, and out of sight of land, is formed on the principles of plain trigonometry; her progress is consequently measured by geometrical rules, and determined by the sides and angles of a right angled plain triangle, in which the hypotenuse is converted into distance, the perpendicular into difference of latitude, the base into departure, and the angles into the course and its complement. See *Course, Departure, Difference of Latitude, and Distance*.

The course of the ship is known to be determined by the compass, and as the mate at the helm directs the ship's motion by this instrument, it is consequently the first thing given in the triangles. The distance is next measured by the log-line and a half or quarter minute glass. See *Compass and Log-line*.

Thus having the course and distance given, we discover the difference of latitude and departure, by the following analogy.

As radius,
To the distance;
So is the sine of the course,
To the departure.

As radius,
To the distance;
So is the co-sine of the course,
To the difference of latitude.

Thus having found the miles of departure, which must necessarily mean

east or west from the last meridian, we convert it into miles of longitude by mercator, and reduce the northing and southing also into miles of difference of latitude; which operation being performed at every alteration of the course on a change of wind, or other accident, the whole northings, southings, eastings, and westings, sailed in twenty-four hours, are disposed in four columns, and the lesser numbers subtracted from the greater, leave the number of miles of difference of latitude north or south, and of departure east or west. The course and distance resulting from these traverses for the twenty-four hours, is then discovered by the following proportion,

As the difference of latitude,
To radius;
So is the departure,
To the tangent of the course.
As the sine of the course,
To the departure;
So is radius,
To the distance.

But if the artist in the run of twenty-four hours has occasion to believe from circumstances, that the angle of the course is nearer truth than the side of the distance, and has proved the accuracy of his difference of latitude by a celestial observation, he will naturally choose to find his distance and departure by the course and the difference of latitude, and will then say,

As the co-sine of the course,
Is to the difference of latitude;
So is radius,
To the distance.

And,

As radius,
To the distance;
So is the sine of the course,
To the departure.

On the contrary, if the navigator has more reason to rely on the certainty of the distance than of the course, and has his difference of latitude confirmed by a solar observation, he is then furnished with two sides of a right angled plain triangle, to discover the angle of the course and the third side; it will then be,

As the distance,
To radius;
So is the difference of latitude,
To the sine complement of the course.

Which subtracted from 90° gives the angle of the course: and then,

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As radius,
To the distance;
So is the sine of the course,
To the departure.

But if a ship has sailed between the meridian and parallel, that is, any where on an angle between the four cardinal points, and is pretty exact in her course, as also in the miles of easting or westing she has made, called her departure, although the distance she has run is not accurately determined, nor is her difference of latitude ascertained; then will the two latter, viz the distance and difference of latitude be discovered, by having the course and the departure given, as thus:

As the sine of the course,
To the departure;
So is radius,
To the distance.
As the tangent of the course,
To the departure;
So is radius,
To the difference of latitude.

Lastly, if a ship has sailed a known distance, till the line of her departure is likewise ascertained, and it be required to find the course she has steered, and the difference of latitude she has made, then must the departure and distance be given to find the course and difference of latitude.

As the distance,
To radius;
So is the departure,
To the sine of the course.
As the tangent of the course,
To the departure;
So is radius,
To the difference of latitude.

Thus have we gone through the six cases of that part of navigation, which is commonly called plain sailing, and exactly similar to the method of working Mercator's or Wright's, which supposes the degrees of latitudes to be protracted in the same ratio, as the degrees of longitude are diminished in their approaches towards the poles of the earth. See *Meridional and Mercator*.

This extension of the degrees of latitude, and consequently of the difference of latitude between any two places, is called the meridional difference of latitude, and is found by taking the meridional parts of any two places from a table calculated for all parallels, and subtracting the lesser from the greater number, if they are both situated north or

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south of the equator. If one of them lies north, and the other south, then is their meridional difference of latitude found by adding their meridional parts; and having this meridional difference given, together with their difference of longitude, we discover the course as in plain sailing.

As the meridional difference of latitude,
To the difference of longitude;
So is radius,
To the tangent of the course.

As the co-sine or sine-complement of the course,
To the real difference of latitude;
So is radius,
To the distance.

Case II. The course and distance sailed being given, to find the difference of latitude and difference of longitude.

First, for finding the difference of latitude by rectangular trigonometry, we have this proportion, viz. as radius is to the distance, so is the co-sine of the course to the proper difference of latitude: and hence, it will be easy to find the meridional difference of latitude; and to find the difference of longitude, the proportion is, as radius to the meridional difference of latitude, so is the tangent of the course to the minutes of difference of longitude.

Case III. Both latitudes, viz that sailing from and coming to, being given; to find the distance sailed, and the difference of longitude.

First, for the difference of longitude, the proportion will be; as radius is to the enlarged or meridional difference of latitude, so is the tangent of the course to the minutes of difference of longitude.

Then for the direct distance, the proportion is, as radius to the proper difference of latitude, so is the secant of the course to the direct distance.

Case IV. Both latitudes and distance sailed being given, to find the direct course and difference of longitude.

First, for finding the angle of the course, the proportion is; as the proper difference of latitude is to radius, so is the distance sailed to the secant of the course: then, for the difference of longitude, it will be; as radius to the meridional difference of latitude, so is the tangent of the course to the minutes of difference of longitude.

Case V. One latitude, course, and difference of longitude being given; to find the other latitude, and distance sailed.

First

First say, as the tangent of the course is to radius, so is the minutes of difference of longitude to the enlarged difference of latitude; whence the minutes of difference of latitude may be found: then to find the direct distance, say; as radius is to the proper difference of latitude, so is the secant of the course to the direct distance.

Case VI. One latitude, course, and departure being given; to find the other latitude, distance sailed, and difference of longitude.

First, for the distance, the proportion is; as the sine of the course is to the departure, so is radius to the direct distance; then, for finding the proper difference of latitude, we have this analogy, viz. as the tangent of the course is to the departure, so is radius to the proper difference of latitude: next, to find the difference of longitude, say; as radius is to the meridional difference of latitude, so is the tangent of the course to the minutes of difference of longitude.

Case VII. Both latitudes and departure being given, to find the course, distance, and difference of longitude.

First, for the difference of longitude, the proportion is; as the proper difference of latitude is to the departure, so is the enlarged difference of latitude to the minutes of difference of longitude: next, for the course, it will be; as the proper difference of latitude is to the departure, so is radius to the tangent of the course: and lastly, to find the distance, we have this analogy; as the sine of the course is to the departure, so is radius to the direct distance.

Case VIII. One latitude, distance sailed, and departure being given; to find the other latitude, difference of longitude, and course.

First, for the course, say; as the distance is to radius, so is the departure to the sine of the course: next, for the difference of latitude, the proportion will be; as radius to the distance, so is the co-sine of the course to the difference of latitude; whence the meridional difference of latitude may be found: lastly, to find the difference of longitude; say, as the proper difference of latitude is to the departure, so is the enlarged or meridional difference of latitude to the minutes of difference of longitude.

In working the different problems of plain, or Mercator's sailing, there is one universal axiom, to which we may refer for stating the proportion according to art.

Axiom. In all cases of plain sailing, if either of the legs (the difference of latitude or the departure) be made the radius of a circle, the other leg will be a tangent to its opposite angle; and the hypotenuse, or distance, will be a secant to that same angle: but if the distance be made radius of a circle, then will the legs be sines to their opposite angles. A general rule to find a side; the proportion must begin with an angle; but to find an angle, begin with a side.

NAVIS, *Argo navis*, or the ship Argo, in astronomy. See *Argo*.

NAUSEA, in medicine, a reaching, or propensity and endeavour to vomit, arising from a loathing of food, excited by some viscid humour that irritates the stomach. In this disorder the patient is so far from desiring aliment, that he loaths it. It either proceeds from a fault in the stomach, or is derived from other diseases, or is a symptom thereof, particularly acute inflammations, asthma, dropsy, hypochondriac passion, &c. or when the humours are corrupted, and the spirits suppressed, in malignant diseases. Vomiting in this case is proper, or purging when that is forbid. To these should be joined strengtheners of the stomach, and chiefly stomachic balsams, made of oil and nutmegs, and distilled oils, and stomachic plasters. Hoffman says, that there is nothing better than mint, its spirituous water, and distilled oil; likewise mastic and its spirit, or balsam of Peru distilled with salt of tartar. In acute fevers, especially the malignant, epidemic, and spotted, there is generally a nausea and reaching to vomit, for which reason emetics are good: likewise in the dysentery, especially when it is epidemic in a camp, emetics are not only useful but necessary, with a slender diet.

NAUTICAL PLANISPHERE, a description of the terrestrial globe upon a plane, for the use of mariners, called also chart. See *Chart*.

NAUTILUS, in natural history, a simple shell, having no hinge, formed of one continued piece, rolled as it were into a spiral form, and having its cavity divided into a great number of cells by transverse partitions, each of which has a perforation, and is continuous to the others, by means of a siphunculus carried the whole length of the shell. The animal inhabiting this shell is a sepiæ.

Of the nautili, some are thick and strong, others thin, light, and brittle; some are aurated, others are not so; and

H h a some

N A Y

some are smooth on the external surface, and others furrowed.

N A V Y, the fleet or shipping of a prince or state. See *Fleet*.

* NAYLOR (JAMES), a remarkable enthusiast, among the people called Quakers, was born of reputable parents at Ardsloe, near Wakefield, in Yorkshire, about the year 1616, and was educated amongst the Independents: he married at the age of twenty-two, and settled at Wakefield; but on the breaking out of the civil wars, in 1641, he entered as a common soldier in the parliament army, under lord Fairfax, and was afterwards a quarter-master in a troop of horse, under General Lambert; but being taken ill in Scotland, in 1649, he left that service, and returned home. In 1651, having heard the doctrine of the Quakers preached by the famous George Fox, he was converted to their principles, and soon distinguished as an eminent preacher among them. He was zealous in the exercise of his function, and well approved by his brethren for some time; but being very eloquent as a preacher, he made such an impression on the minds of a few weak people, (principally women) who professed to be of the same society, that they began to consider him as more than human, and to pay him a sort of adoration; inasmuch that in some letters they wrote to him, they styled him; "the everlasting son of righteousness, the prince of peace, the only begotten son of God, the fairest of ten thousands, &c." It is also said they kneeled before him in Exeter prison, (to which, as the persecution was hot against the Quakers, he was committed) and to have kissed his feet, in acknowledgment of his divinity. These instances of fanaticism he did not reject, from a deluded imagination, that as, according to his faith, the spirit of Christ dwelled in all men, he had no authority to refuse any tribute of reverence which they were induced to pay. This extravagant notion procured him the censure of his brethren, who declared him no longer a member of their community; and as he soon grew more enthusiastical, in a short time subjected him to severe punishment; for being discharged from Exeter prison in the course of the same year, he suffered himself to be conducted into Bristol, on horse-back, in a kind of religious triumph, resembling the manner of our Saviour's entrance into Jerusalem; a man went uncovered before him; a woman led his horse, whilst several

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others spreading their handkerchiefs and scarfs, exclaimed, "Holy! holy! holy! is the Lord God of Hosts!—Hosannah to the Highest!—Holy! holy! holy is the Lord God of Israel!" In consequence of this frantic conduct, they were all immediately committed to prison, from whence Naylor was soon after removed to London, and tried by the parliament for blasphemy. The trial lasted several days; but being at last convicted, he was sentenced to stand twice in the pillory; once in Palace-yard, Westminster, and once at the Old Exchange, London, wearing at each place an inscription of his crimes; to be once whipped through the streets, from Westminster to the Old Exchange, by the common hangman; to have his tongue bored through, at the last mentioned place, with a hot iron, and his forehead branded with the letter B. afterwards to be sent to Bristol, and conveyed through the city on a horse, with his face backward; to be there publicly whipped on a market-day, and then committed close prisoner to Bridewell, in London, during the pleasure of parliament. Many humane people, inclined to pity him as an enthusiast, than to see him punished as a blasphemer, presented petitions to parliament for a mitigation of the severity of this sentence, but without success. His punishment was inflicted with the greatest severity, and borne with amazing patience and resignation: and when discharged from Bridewell, he went to Bristol, where, in a meeting of his friends, he made a public recantation, in so affecting a manner, that they were mostly convinced of the sincerity of his repentance, and became reconciled to him. It having been also reported of this extraordinary man, that he was guilty of adultery with those women before-mentioned, whilst he was under confinement, we think it incumbent upon us, as impartial biographers, to insert his own declaration, which he gave out in writing, concerning it.---"As to that accusation, as if I had committed adultery, with some of those women who came with us from Exeter prison, and also those who were with me at Bristol the night before I suffered there; of both which accusations I am clear before God, who kept me at that day, both in thought and deed, as to all women, as a little child."---During the short time he lived afterwards, he bore the reproach of his former conduct with becoming patience, evin-

evinced to the world, by his seriousness and humility, a rectified judgment and Christian disposition. But being on a journey from London to Wakefield, in 1660, he was taken ill, and died at the house of a friend, near King's-Rippon, in Huntingdonshire, in the forty-fourth year of his age. He wrote several books and papers, in vindication of himself from the unjust accusations of his adversaries, and also in support of the principles of the Quakers.

* NAZARETH, an ancient city of Palestine, in Asia, famous for its being the place of abode of Jesus Christ, in the former part of his life. It is now only a small village, seated on the side of a mountain, and surrounded by other small ones. The monks of the order of St. Francis have a convent here. Long. 35. 40. E. Lat. 32. 30. N.

NEALING, or ANNEALING, a term used for the preparing of several matters, by heating or baking them in an oven, or the like.

NEALING of glass. See *Glass*.

NEALING of steel. See *Steel*, *Tempering*, &c.

NEAT, or NET-WEIGHT, the weight of a commodity alone, clear of the cask, bag, case, or even filth. See *Weight*.

NEBULY, or NEBULEE, in heraldry, is when a coat is charged with several little figures in form of words, running within one another, or when the outline of a bordure, ordinary, &c. is indented or waved.

NECESSARY, in a philosophical sense, that which must be, or cannot be otherwise.

NECESSITY, whatever is done by a necessary cause, or a power that is irresistible, in which sense it stands opposed to freedom.

NECK, *collum*, in anatomy, that slender part situated between the head and the trunk of the body. The neck consists of the following parts: 1. the common integuments; 2. seven vertebræ; 3. a number of muscles which serve to move the head, the neck, the larynx, the pharynx, and the os hyoides; 4. a number of very large arteries, as the carotids, internal and external, and the vertebral ones; 5. of large veins, as the jugular, internal and external, and the vertebral ones; 6. of large nerves, of the par vagum, the intercostals, the recurrent, the diaphragmatics, and the vertebral; 7. a part of the spinal marrow; 8. the aspera arteria, or trachea, particu-

larly the larynx, in which is an eminence called the pomum adami; 9. the pharynx, with a part of the oesophagus; 10. the thyroide, with some other smaller glands.

Luxation of the Neck. If life remain after such an accident, the patient is to be immediately laid flat on the ground or floor; then the surgeon, laying hold of his head, is to extend it strongly, gently moving it from side to side, till he finds the neck is restored to its natural posture. Mr. Petit mentions another method, by means of slings; but Heister gives the preference to the former method, as being more simple, and because the patient can be relieved much sooner.

NECTAR, *νεκταρ*, among ancient poets, the drink of the fabulous deities of the heathens, in contradistinction from their solid food, which was called ambrosia. This word is also used by some of the ancients to express honey.

NECTARINE, a fruit differing from the common peach, of which it is a species, in having a smoother rind and a firmer pulp.

NEEDLE, *acus*, a common little instrument or utensil, made of steel, pointed at one end, and pierced at the other, used in sewing, embroidery, tapestry, &c. Needles make a very considerable article in commerce, though there is scarce any commodity cheaper, the consumption of them being almost incredible. The sizes are from N^o 1 the largest, to N^o 25, the smallest. In the manufacture of needles, German and Hungarian steel are of most repute.

Magnetic NEEDLE, in navigation, a needle touched with a load stone, and sustained on a pivot or center, on which playing at liberty, it directs itself to certain points in or under the horizon; whence the magnetical needle is of two kinds, viz. horizontal and inclinatory. See *Magnet*.

NÉGATION, in logic, an act of the mind, affirming one thing to be different from another; as, that the soul is not matter.

NEGATIVE, in general, something that implies a negation: thus we say negative quantities, negative signs, negative powers, &c. Our words and ideas, says Dr. Watts, are so unhappily linked together, that we can never know which are positive, which negative ideas, by the words that express them; for some positive terms denote a negative idea, as, dead: and there are both

both positive and negative terms invented to signify the same and contrary ideas, as, unhappy and miserable. To this may be also added, that some words, which are negative in the original language, seem positive in English, as, *abyss*. The way therefore to know whether any idea be negative or not, is to consider whether it primarily implies the absence of any positive being, or mode of being; if so, then it is a negative idea, otherwise a positive one.

According to logicians, the only way to prove a negative, is by converting it into an affirmative.

NEGROES, properly the inhabitants of Negritia, in Africa; also called blacks and moors; but this name is now given to all blacks. The origin of the Negroes, and the cause of this remarkable difference from the rest of the human species, has much perplexed the naturalists: Mr. Boyle says it cannot be produced by the heat of the climate; for though the heat of the sun may darken the colour of the skin, yet experience does not shew that it is sufficient to produce a true blackness, like that of the Negroes. Even in Africa, many nations of Ethiopia are not black, nor were there any blacks originally in the West-Indies. In many parts of Asia under the same parallel with the African region, inhabited by blacks, the people are but tawney. He adds, that there are Negroes in Africa beyond the southern tropic, and that a river sometimes parts nations, one of which is black, and the other only tawney. Dr. Barriere alledges, that the gall of Negroes is black, and being mixed with their blood, is deposited between their skin and scarfe-skin. However, Dr. Mitchell, of Virginia, in the Philosophical Transactions, N^o 476, has endeavoured by many learned arguments to prove, that the influence of the sun in hot countries, and the manner of life of their inhabitants, are the remote causes of the colour of Negroes, Indians, &c. and indeed it would be a strong confirmation of his doctrine if we could see any people, originally white become black and woolly by transplantation, or *vice versa*.

NEHEMIAH, a canonical book of the Old Testament, so called from the name of its author. Nehemiah was born at Babylon during the captivity, and succeeded Ezra in the government of Judah and Jerusalem. He was a Jew, and was promoted to the office of cup-bearer to Artaxerxes Longermanus, king of Persia;

when the opportunities he had of being daily in the king's presence, together with the favour of Esther the queen, procured him the favour of being authorized to repair and fortify the city of Jerusalem, in the same manner as it was before its destruction by the Babylonians. On his going to Jerusalem, he finished the rebuilding of the walls in fifty-two days, and dedicated the gates of the city with great solemnity. He then reformed some abuses which had crept in among his countrymen, particularly the extortion of the usurers, by which the poor were so oppressed as to be forced to sell their lands and children for support. After which he returned to Persia, and came back again with a new commission, by virtue of which he regulated every thing relating both to the state and religion of the Jews. The history of these transactions is the subject of this book.

* **NEMESIS**, in Pagan worship, the daughter of Jupiter and necessity, or, according to others of Oceanus and Nox; she had the care of revenging the crimes which Human Justice left unpunished. She was likewise called Adrastica, because Adrastus, king of Argos, first raised an altar to her; and Rhamnusia, from her having a magnificent temple at Rhamnus in Attica. She had likewise a temple at Rome in the Capitol. She is represented with a stern countenance, holding a whip in one hand, and a pair of scales in the other.

NEMINE CONTRADICENTE, *nemine contradicente* it, a term chiefly used in parliament, &c. when any thing is carried without opposition.

NENIA, or **NÆNIA**, in antient poetry, a mournful kind of song, filled with the praises of some deceased person, and sung during the celebration of the funeral.

* **NÆNIA**, in pagan worship, a goddess supposed to preside over the melancholy performances sung at funerals, in honour of the dead, to flutes and other instruments, by women who are hired for that purpose. These funeral songs, says Horace, were first invented by Simonides, a Greek lyric poet, and called Næniz, from the name of the goddess who presided over them. The flutes at the funerals of both Greeks and Romans, were not only used to accompany the voice of those who sung the Næniz, but to point out the exact time when the assistants were to strike their breasts, in token of their sorrow, which was to be performed in cadence with the music.

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NEPENTHES, *venereum*, a medicine mentioned by Homer, as most efficacious against grief and sorrow. He says, that whosoever should take it mixed with wine, could not be sensible of grief for that whole day, though his father or mother were to die.

NEPER'S RODS, or **BONES**, an instrument invented by J. Neper, baron of Merchiston, in Scotland, whereby the multiplication and division of large numbers are much facilitated.

As to the construction of NEPER'S ROD: suppose the common table of multiplication to be made upon a plate of metal, ivory, or paste-board, and then conceive the several columns (standing downwards from the digits on the head) to be cut asunder; and these are what we call Neper's rods for multiplication. But then there must be a good number of each; for as many times as any figure is in the multiplicand, so many rods of that species (*i. e.* with that figure on the top of it) must we have; though six rods of each species will be sufficient for any example in common affairs: there must be also as many rods of o's.

But before we explain the way of using these rods, there is another thing to be known, *viz.* that the figures on every rod are written in an order different from that in the table. Thus the little square space or division in which the several products of every column are written, is divided into two parts by a line across from the upper angle on the right to the lower on the left; and if the product is a digit, it is set in the lower division; if it has two places, the first is set in the lower, and the second in the upper division; but the spaces on the top are not divided. Also there is a rod of the digits, not divided, which is called the index rod, and of this we need but one single rod.

Multiplication by NEPER'S RODS: first lay down the index rod; then on the right side of it set a rod, whose top is the figure in the highest place of the multiplicand: next to this again, set the rod whose top is the next figure of the multiplicand; and so on in order, to the first figure. Then is your multiplicand tabulated for all the nine digits; for the same line of squares standing against every figure of the index rod, you have the product of that figure, and therefore you have no more to do but to transfer the products and sum them. But in taking out these products from the rods, the order in which the figures stand, obliges

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you to a very easy and small addition: thus, begin to take out the figure in the lower part, or unit's place, of the square of the first rod on the right; add the figure on the upper part of this rod to that in the lower part of the next, and so on, which may be done as fast as you can look on them.

Division of NEPER'S RODS: first tabulate your divisor; then you have it multiplied by all the digits, out of which you may choose such convenient divisors as will be next less to the figures in the dividend, and write the index answering in the quotient, and so continually till the work is done.

NEPHEW, a term relative to uncle and aunt, signifying a brother or sister's son, who, according to the civil law, is in the third degree of consanguinity; but according to the canon in the second.

NEPHRITIC, something relating to the kidneys. See *Kidney*.

NEPHRITIC WOOD, *Lignum Nephriticum*, an American wood, brought to us in large compact ponderous pieces, without knots; the outer part is of a whitish or pale yellowish colour; the medullary substance of a dark brownish or reddish.

This wood stands greatly recommended in difficulties of urine, nephritic complaints, and all disorders of the kidneys, and urinary passages; and it is said to have this peculiar advantage, that it does not, like the warmer diuretics, heat or offend the parts. The blue aqueous tincture is directed to be used as common drink, and fresh water to be poured on the remaining wood so long as it communicates any blueness. For medical purposes Geoffroy says, he has seen some instances of its being used, but without success; and indeed what ever may be the virtues of strong infusions or extracts of the wood, the exceedingly dilute blue tincture cannot be expected to have much efficacy.

NEPHRITICS, in pharmacy, medicines proper for diseases of the kidneys, especially the stone. See *Stone*.

NEPHRITIS, *Dolor Nephriticus*, or **NEPHRITIC CHOLIC**, in medicine a painful disease, occasioned by the stone or gravel in the kidneys, in which there is an inflammation. That the kidneys labour under a true inflammation, may be known from the burning pungent pain of the part where the kidneys lie; from an acute continual fever; from the small quantity of urine, which is deep coloured,

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or, in the height of the disorder, aqueous; the stupor of the adjacent leg; the pain of the groin, and contiguous testicle; pain of the ilium; the vomiting of bile, and continual eruclations.

Such an inflammation is cured, when nature is benign, and the disease favourable, first by resolution; secondly by a copious red and thick urine, continually discharged before the seventh, or at most the fourteenth day of the disease; and thirdly by a copious discharge from the hemorrhoidal veins in the beginning of the disorder.

The disorder, when the inflammation is known to be present, is to be cured first by the general remedies appropriated to the cure of all inflammations, as venesection, revulsion, and dilution; secondly, by mild emollient, and antiphlogistic decoctions, drank in large quantities.

Thirdly, this species of the disorder is cured by clysters, fomentations, and baths; and fourthly by mild and moist aliments, by rest, by not lying too warm in bed, and especially not lying on the back.

If the pains and convulsions are excessively violent, opiates are beneficial. The excessive vomiting is to be relieved by a frequent exhibition of tepid water, edulcorated with honey. Thus a nephritis arising from a stone impacted in the ureters and kidneys, may be safely cured.

If the disorder be protracted, notwithstanding the above method of cure, beyond the seventh day, an abscess is to be dreaded, the formation of which may be known from a remission of the pain, succeeded by a pulsation, and frequently returning horror, a weight and stupor of the part, from fetid, apparently saline, and putrified urine. We are first to use powerfully maturing and emollient medicines; then, when the urine appears purulent, we must exhibit diuretics, consisting of pure medicated waters, whey, &c. using at the same time balsamics.

If this suppuration should continue long, the whole kidney, being consumed, forms a kind of useless bag; and in this case, a *tubis renalis* is frequently present.

If a scirrhus be formed, there arises an incurable palsy, or lameness of the subjacent leg. Hence also are often produced a slow consumption and drop'y.

If a small quantity of the inflammatory matter remains in the minute follicle of the urine, it forms a kind of basis, to which the fabulous matter of the urine gradually adhering, forms a stone in the

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kidneys, which is by degrees augmented. A nephritis also sometimes degenerates into a gangrene. *Boerhaave's Aphor.*

* NEPTUNE, in Pagan worship, the god of the sea, the son of Saturn and Vesta or Ops, and the brother of Jupiter and Pluto. He assisted Jupiter in his expeditions, who, when he arrived at the supreme power, assigned him the sea and the islands for his empire. He was, however, expelled from heaven with Apollo, for conspiring against Jupiter, when they were both employed by Laomedon, King of Phrygia, in building the walls of Troy, but that prince dismissing Neptune without a reward, he sent a sea monster to destroy the country, whereupon he was obliged to expose his daughter Hesiote. He is said to have been the first inventor of horsemanship and chariot racing, on which account Mithradates, king of Pontus, threw chariots drawn by four horses into the sea, in honour to Neptune, and the Romans instituted horse-races in the circus at his festival: during which time no other horses were permitted to work, and the mules were adorned with wreaths of flowers. In a contest with Minerva he produced a horse by striking the earth with his trident; and on another occasion, in a trial of skill with Minerva and Vulcan, he produced a bull, whence that animal was sacrificed to him. His favourite wife was Amphitrite, whom he long courted in vain, till sending the dolphin to intercede for him, he succeeded, on which he rewarded the dolphin by placing him among the stars. He had also two other wives, one called Salacia, from the salt water, the other Venilia, from the ebbing and flowing of the tides. He had also many concubines, by whom he had many children. He is represented with black hair, with a garment of an azure or sea-green, with his trident in his hand, and seated on a large shell, drawn by sea-horses, attended by the sea-gods Palæmon, Glaucus, and Phorcus, and the sea-goddesses Thetis, Melita, and Panopea, and a long train of tritons, and sea nymphs.

NEREIDS, in the Pagan theology, sea nymphs, daughters of Nereus and Doris. Hesiod reckons up fifty of them; and Homer gives us a list and description of thirty-nine nereids. Virgil's list of the nereids is shorter, but diversified with pretty circumstances, as may be seen, *Georg. lib. iv. v. 336. & seq.*

The nereids were esteemed very handsome, inasmuch that Cassiope, the wife of

of Cepheus, king of Ethiopia, having triumphed over all the beauties of her age, and daring to vie with the Nereids, they were so enraged, that they sent a prodigious sea-monster into the country; and to appease them, she was commanded by the oracle to expose her daughter Andromeda, bound to a rock, to be devoured by the monster. In ancient monuments the Nereids are represented riding upon sea-horses, sometimes with an entire human form, and at other times with the tail of a fish.

* NEREUS, in fabulous history, a marine deity, the son of Oceanus and Thetis. He settled in the Aegean sea, he was considered as a prophet, and had the power of assuming what form he pleased. He married his sister Doris, by whom he had fifty daughters called the Nereids, who constantly attended on Neptune.

* NERO DOMITIUS, emperor of Rome, the son of Caius Domitius Enobarbus and Agrippina, the daughter of Germanicus, was adopted by the emperor Claudius in the year 50, and succeeded him in 54, to the prejudice of Britannicus, the son of Claudius and Messalina, who by birthright had the next claim to the empire. At the beginning of his reign he promised to follow the example of Augustus, and made himself beloved by his liberality and clemency. One day, when the sentence of a person condemned to death was presented to him to be signed, he cried, "I heartily wish I could not write;" and as the senate returned him thanks for his just administration, he replied, "It will be time enough for thanking me when I have deserved it." In short the whole empire resounded with his praises so long as he followed the wise advice of Burrhus and Seneca, one of whom had been his governor and the other his preceptor. But after he had reigned five years, he abandoned himself to the most shameful excesses, and the most extravagant crimes. He placed himself on the throne in a female habit, and committed the most abominable kind of lewdness, particularly with Sporus, whom he kept in his house dressed like a woman, on which it was said, by way of raillery, that "it would have been happy for the world if his father Domitius had had such a wife." He poisoned Britannicus; murdered his mother and his wife Octavia, and killed with a kick Poppaea, whom he had married, and who was pregnant. Seneca was

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by his order bled to death. This inhuman prince often wished the whole human race had but one head, that he might have the pleasure of cutting it off. In the year 64 he set the city of Rome on fire, in order to have the honour of rebuilding it, and giving it his name. While it was burning he mounted upon a tower, dressed like a comedian, and there sung a poem on the ruin of Troy. He afterwards accused the Christians of burning that city, published cruel edicts against them, and began the first persecution of the church. In the year 66 he took a journey into Achaia, and resolved the following year to cut through the isthmus of Corinth, which failed of success from the great sums he squandered in superfluous expences. He commonly laid ten thousand crowns on one cast of the dice, and used to angle with a golden rod and a scarlet line. His detestable conduct rendered him the abhorrence of mankind. The Roman army in Gaul refused to serve him, and Galba revolted against him in Spain; at which news Nero fell into despair, and finding he was abandoned by every body, cried in a rage, "Have I then neither friends nor enemies?" He afterwards escaped in disguise, but fearing lest he should be taken by those who pursued him, put an end to his life by his own hand, on the 9th of June, 68, at the age of thirty-two, after a reign of thirteen years and eight months, wanting only two days. He was succeeded by Galba.

NERVES, *nervi*, in anatomy, cylindrical whitish parts, usually fibrous in their structure, or composed of clusters of filaments, arising from the brain, or rather from its medulla oblongata within the skull, and from the spinal marrow, and running from thence to every part of the body.

The great use of the nerves, though we are not able perfectly to demonstrate it, seems to be to convey to all parts of the body a fluid of an extremely subtle kind, secreted in the brain and spinal marrow, and destined for no less noble a purpose than the sensation, motion, and nutrition of the several parts of the whole human fabric. Those who would enter farther into this subject, may consult Heister's Anatomy; Boerhaave's Chapter on the Brain, in his Institutes; Morgagni's Adversar, where he treats it judiciously and deeply; and after these, Burggrave on the Existence of the Animal Spirits. See *Brain*.

Origin, Distribution, and Names of the NERVES. The Nerves are usually divided into two kinds, those which arise from the brain, and those arising from the spinal marrow.

* **NETHERLANDS**, a country of Europe, anciently called Belgic Gaul, which then comprehended the whole extent of land between France, Germany, and the ocean. It was called the Netherlands from its being near the sea, where several rivers fall into it. The Netherlands antiently belonged to the Duke of Burgundy; but came at length to Maximilian, archduke of Austria, by his marrying the heiress of the last duke of Burgundy, to whom they belonged. After which, the emperor Charles V. their grandson, becoming king of Spain, reunited them to that kingdom. Philip II. his successor, being desirous of establishing the inquisition there; and the duke of Alba, who was their governor, treating the people with much severity, they revolted, and were supported by William of Nassau, prince of Orange. Nevertheless the duke of Parma conquered nine of these provinces out of seventeen; but the emperor having taken some part of these, the rest were ceded to him by the treaty of Utrecht. These provinces had the name of the Spanish Netherlands, to distinguish them from the states of Holland, and the French Netherlands. Flanders is a particular province of the Austrian Netherlands, and has given its name to the other eight, whose inhabitants are called Flemings. This country is plentiful in corn and pastures, but produces no wine. The cities are very numerous, populous, and almost all fortified; being frequently harrassed by war. The principal rivers are the Maese, the Scheld, the Lys, the Scarpe, the Dylle, and the Samber. They have made two canals, for the more easy transportation of merchandize, one of which begins at the harbour of Ostend, passes to Bruges, and then goes to Ghent, where the Lys and Scheld unite. The other is that at Brussels, and passes to Antwerp. Of the nine provinces of the Austrian Netherlands, three lie to the E. namely, the dutchies of Brabant, Limburg, and Luxemburg. The counties of Flanders and Artoise are to the W. but this last has belonged to France a long while. The counties of Hainault and Namur are to the S. and the three dutchies and the four counties, the marquisate of the holy empire, and the lordship of Mechlin, are to the N. Ar-

toise, part of Flanders, Hainault, and the Cambresis, are in the possession of the French, and are called the French Netherlands. Likewise the Dutch are in possession of the N. part of Brabant and Flanders, which are therefore called Dutch Brabant, and Dutch Flanders.

The United Netherlands lie to the N. of the former. and are bounded by Lower Germany on the E. by the Austrian Netherlands on the S. and on the west and North by the ocean. The name of the United Provinces proceeds from a treaty made at Utrecht in 1579, for their mutual defence against the king of Spain, since which time they have thrown off his yoke, and at the treaty of Munster, in 1648, the king of Spain was obliged to acknowledge them a free and independent people; and this country is called Holland, after their most considerable province. The number of these provinces is usually said to be seven, though they are in reality eight; for two of them, namely, Guelderland and Zutphen, have but one voice in the assembly of the States-General. These eight form one dutchy, three counties or earldoms, and four lordships, whose names are as follows, according to the priority of their voices: the duchy of Guelderland the county of Zutphen, which with the former makes one province; the county of Holland, that of Zealand, the lordships of Utrecht, of Frieseland, of Over-Yssel, and Groningen. Each of these eight provinces, which compose what are called the States-General, is a sovereign state, and is governed according to its own laws and customs. Even every city, though under its province in many things, enjoys a supreme power in all the rest, and has a council or particular senate. The deputies of the city have each their voice, and the nobles of every province have but one altogether. All the deputies form three assemblies, which are always held at the Hague, namely, the states-general, the council of state, and the board of accounts. The Assembly of the states-general has the principal direction of affairs, and give audience to foreign ministers. The most important matters require the consent of all the provinces before they can be determined; but the rest are decided by a plurality of voices. Each province decides in its turn every week, and the ministers ought to apply to the president of the province, who has the direction of affairs at that time. The council of state executes the deci-

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ons of the states-general, and is composed of twelve deputies, two of whom are for the province of Guelderland, three for Holland, two for Zealand, one for Utrecht, two for Friesland, one for Over-Yssel, and one for Groningen. Affairs of this board are determined by a plurality of voices. The board of accounts takes notice of the states of finances, and is likewise composed of the deputies of the provinces.

NETTLE, *Urtica*, in botany, a genus of plants, without any flower petals: the seed is single, and contained in the cup, which closes for that purpose. The root of the common nettle is accounted diuretic and lithontriptic: it serves also to purify the blood, and is good in spittings of blood, hæmorrhages, and the menies. The seeds of the Roman nettle are recommended in the asthma, and other disorders of the lungs.

NEUTER, or **NEUTER GENDER**, in grammar, a sort of gender of nouns in the learned languages, which are neither masculine nor feminine.

NEUTRAL SALTS, in chemistry, a sort of intermediate salts between acids and alcalies, participating of the nature of both, so that one does not predominate over the other. The chief of this kind among the native salts are common salt, nitre, aphronitrum, the essential salts of plants, and those obtained by boiling from some medicinal and acidulated springs. Those prepared by art, are the arcanum duplicatum, antimoniated nitre, Glauber's salts, and vitriolated tartar. Salts of a temperate and neutral nature, are not only of all others the most salutary, but also the safest and most efficacious, both for preventing and curing some of the disorders incident to the human body.

NEUTRALITY, the state of a person or thing that is neuter.

* **NEWARK**, siege of, and battle at. This battle was fought during the time of the grand rebellion, viz. 1644. Whilst the marquis of Newcastle was in the North, observing the Scottish army, the lord Willoughby, of Parham, and Sir John Meldrum, with about 5000 men of the parliament-forces, laid siege to Newark, wherein the king had put a garrison. As soon as Charles knew of this proceeding, he sent orders to prince Rupert to endeavour to relieve the place. The prince being then at Chester, put himself immediately upon the march, and being joined by other troops, made a

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body of 7000 men, with whom he advanced towards Newark. Meldrum, who commanded alone at the siege, (the lord Willoughby being gone elsewhere) resolved to fight the prince, and for that purpose drew up his forces, at a little distance from the town. On the 21st of March, there was a sharp conflict, particularly at a bridge over which Meldrum had resolved to retreat, in case of need. The bridge was vigorously attacked, and as bravely defended. Mean while, after the fight was over, Meldrum finding himself too weak to renew it the next day, resolved to retreat over the bridge in the night: but he found the guard he had left there, had deserted, and the bridge in possession of the enemies. So not being able to retreat, and perceiving himself surrounded with the king's forces, Meldrum sent a trumpet to the prince, to desire a parley. It was agreed that the foot should march away with their swords, colours, and drums; all the officers, with their arms, horses, and baggage; and the troopers and dragoons, with their swords, hories, and colours. But he was forced to deliver all his ordnance and ammunition, with about 3000 muskets. The prince, after this expedition, which did him great honour, returned to Shropshire, and from thence into Lancashire, to relieve the countess of Derby, who, for the space of eighteen weeks, was besieged in her house of Latham, and made a gallant defence against a body of 2000 parliamentarians. In a sally, on the 6th of May, the besieged slew near 300 of the besiegers. Prince Rupert, in his way to Latham, took Stopworth in Cheshire, and whilst he was advancing towards Latham, the besiegers raised the siege; and part of them, under the command of colonel Rigby, went and reinforced the garrison of bolton in Lancashire. The prince pursued them, and without giving them time to come to themselves, took the town by storm. After that he took Liverpool, also in Lancashire. The governor, colonel More, had not spirit to make any resistance; he evacuated the town in the most precipitate manner: what rich moveables he could put on board the ships in the harbour he did; instead of acquitting himself honourably, according to the trust reposed in him, he minded little else but the preservation of a few trinkets. Here the prince received a letter from the king, commanding him to relieve York, which was besieged, and give the enemy battle.

* **NEWBURY**, battle of, fought in 1643. Prince Rupert was detached over the hills, to intercept the earl of Essex in his march, and amuse him with skirmishes, until the king in person should bring up the infantry. He performed this service with such expedition, that before the enemy reached Newbury, he charged and put their rear in confusion; and, though they behaved with great conduct and resolution, he compelled them to shorten their intended march, and take up their quarters at Hungerford. Next day, which was the 17th of September, the king took possession of Newbury with his foot; so that Essex was obliged to pass the night in the open field; and was indeed in such a situation, that in all probability he would have found it extremely difficult to extricate himself had the royalists avoided a battle: but he was obliged to the impetuosity of some young officers, who despised such maxims of caution. He drew up his men in order of battle, upon Bigs-hill, within a short mile of Newbury, and made such a disposition as became a general of his conduct and experience. The royalists began to skirmish in small successive parties, until they were insensibly engaged so far, that the king found it necessary to hazard a general action. The king's horse charged with their usual intrepidity, and even routed the cavalry of Essex; but they could make no impression upon his foot, behind which the horse rallied as often they were put in confusion. The London-trained bands, in particular, opposed themselves like a rampart against the efforts of the royalists, and managed their pikes with such dexterity, that prince Rupert attacked them in vain, at the head of his choice cavalry. The battle was fought all day, with equal obstinacy on both sides; and night parted the combatants, before either army could claim the victory. The king recalled his troops from the field; and next morning the earl of Essex pursued his march towards Reading, which he reached with his cannon and baggage, after his rear had been severely handled by prince Rupert, who charged it when entangled in defiles, at the head of his horse, and 1000 musqueteers. Though the number of men slain in the battle of Newbury was not very considerable, they sustained irreparable loss in the fate of some worthy noblemen, who fell in the engagement. The earl of Sunderland, a young nobleman of promising parts, was killed by a cannon ball. The earl of

Carnarvon, who had served his royal master with such courage and ability, was run through the body with a sword, and expired in an hour after he received the wound; but the theme of universal lamentation was the death of the great, the good, the amiable Lucius Cary, lord viscount Falkland, secretary of state, the darling of the muses, the patron of learning and merit, the mirror of integrity, and the pattern of consummate virtue. This excellent person had constantly opposed the crown in those measures which he deemed dangerous to the liberty of the subject, and privileges of parliament; but, when he perceived the drift of the demagogues was to ruin the constitution; that the king had sufficiently atoned for the errors of his conduct, during the first part of his reign, by the manifold concessions he had made in favour of his people, he disclaimed their proceedings, and espoused the cause of his sovereign in distress: yet, he was so much afflicted at seeing his country involved in the calamities of a civil war, that he lost his former serenity of temper; he became silent, pensive, and reserved; and, in the midst of his friends, the word "peace" oft broke from him with a profound sigh. He eagerly forwarded every overture of an accommodation; and that his conduct might not seem the result of personal timidity, he exposed himself, on all occasions, to the most eminent hazard, as if he had despised life, or been enamoured of danger. When his temper first changed, he began to neglect the exterior ornaments of his person, in which he had been formerly exact and curious; but in the morning of the battle, as if he had foreseen his fate, he bestowed extraordinary pains upon his apparel, saying, the enemy should not find his body in a slovenly condition. "I am weary of the times," (added he) and foresee much misery to my country; but I believe I shall be out of it before night." He charged in the front of lord Byron's regiment, and being shot in the belly, fell from his horse; but his body was not found till next morning. This is one of the most finished characters we find upon record; and his death the more lamentable, as he died in the 34th year of his age.

* **NEWFOUNDLAND**. An island of North America, and the first land that is made in sailing into the river St. Lawrence, in Canada. It is of a triangular form, 350 miles in length from N. to S. and 200 in breadth from E. to W. where

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it is broadest. It is a much colder country than England, the ground being covered with snow five months in the year, though it lies in between 47 and 52 degrees of N. latitude; but it is much hotter than England in summer. It is a mountainous barren country, but well supplied with wood and water, and has several commodious bays and harbours. The fishing-banks on this coast are frequented by most European nations, and there are seldom less than 5 or 600 sail of ships laden with cod-fish annually. The French had once some settlements here; but the property of this island was yielded to England by the treaty of Utrecht, and by the late peace. It is so uncomfortable a country, that not above 500 English families continue here all the year, besides the garrisons of St. John's, Placentia, and other forts; but in the fishing season, there are generally about 10,000 people more. The inhabitants receive most of their provisions, cloathing, and furniture, by the ships which come from England.

MEW-MOON, *Neum-mea*, that state of the moon a little before and a little after her conjunction with the sun.

NEWEL, in architecture, the upright post which a pair of winding-stairs turn about.

NEWT, or EFT, in zoology. See *Eft* and *Lizard*.

* NEWTON (Sir ISAAC). The most celebrated philosopher and mathematician the world has produced, was born at Woolstrop, in Lincolnshire, March 25, 1642, and was descended from the elder branch of the family of Sir John Newton, baronet. His father dying young, his mother put him to the free-school at Grantham, in Lincolnshire, when he was twelve years of age, and removed him from hence some years after, in order to accustom him betimes to look into his own affairs; but finding him entirely devoted to his books, she sent him again to Grantham, and when eighteen years of age, removed him to Trinity College, Cambridge. M. de Fontanelle tells us, "that in learning mathematics he did not study Euclid, who seemed to him too plain and simple, and unworthy of taking up his time. He understood him almost before he read him, and a cast of his eye upon the contents of his theorems, was sufficient to make him master of them. He advanced at once to the geometry of Des Cartes, Kepler's Optics, &c. It is certain, that he had made his great discoveries in geometry, and laid the founda-

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tion of his two famous works, the *Principia* and the *Optics*, by the time he was 24 years of age." In 1664, he took the degree of bachelor of arts, and in 1668, that of master of arts, being elected the year before fellow of his college. He had before this time discovered the method of fluxions, and 1669 he was chosen professor of mathematics in the university of Cambridge. The same year, and the two following, he read a course of optical lectures in Latin, in the public schools of the university. After having revised and enlarged his *Principia*, he published it first in 1687, in 4to. and of this work the highest encomiums have been made, both by Englishmen and foreigners, who have treated it rather as the production of a celestial intelligence, than that of a man. The very same year which this great work was published, the university of Cambridge was attacked by king James II. when he was one of its most zealous defenders, and was accordingly nominated one of the delegates of that university to the high-commission court; and the next year he was chosen one of the members for the convention-parliament, in which he sat till it was dissolved. In 1696, Mr. Mountague, then chancellor of the exchequer, and afterwards earl of Halifax, obtained for him of the king, the office of warden of the mint, in which employment he was of signal service, when the money was called in to be recoined. Three years after he was appointed master of the mint, which he enjoyed till his death. In 1699, he was elected one of the members of the Royal Academy of Sciences at Paris. In 1701, he was a second time chosen member of parliament for the university of Cambridge. In 1703, he was elected president of the Royal Society, and continued in the chair for 23 years, without interruption, till the day of his death. In 1704, he published, at London, in 4to. his *Optics*, and 1705, he was knighted by queen Anne. In the reign of king George I. he was better known at court than before. This great man had all along enjoyed a settled and equal state of health, to the age of 80, when he began to be afflicted with an incontinence of urine. However, for the five following years, he had great intervals of ease, which he procured by the observance of a strict regimen; it was then believed that he certainly had the stone, and when the paroxysms were so violent, that large drops of sweat ran down his face, he never uttered

uttered the least complaint, or expressed the smallest degree of impatience; but as soon as he had a moment's ease, would smile and talk with his usual cheerfulness. Till then he always read and wrote several hours in a day. He had the perfect use of all his senses and understanding, till the day before he died, which was the 20th of March, 1726-7, in the 85th year of his age. The honours paid to the body of this great philosopher, have been the admiration of foreigners, and have been a greater honour to the nation, who have given such public testimonies to his merit. He lay in state in the Jerusalem chamber, at Westminster, and on the 28th of March, his body was conveyed to Westminster Abbey: the pall being supported by the lord chancellor, the dukes of Montrose and Roxburg, and the earls of Pembroke, Suffolk, and Macclesfield. The bishop of Rochester read the funeral service, being attended by all the clergy of the church. The corps was interred just at the entrance into the choir, where a noble monument is erected to his memory. He was of a middling stature, and the latter part of his life somewhat inclined to be fat. His countenance was pleasing, and at the same time venerable. He never made use of spectacles, and lost but one tooth during his whole life. He was of a very meek disposition, and had the greatest modesty, which he never lost, though the whole world conspired against it. He was candid and affable, and always put himself upon a level with his company. When decency, upon any occasion, required expense and shew, he was magnificent, without grudging it, and with a very good grace; but at all other times that pomp was intirely retrenched, and the expense reserved for acts of beneficence.

The following epitaph was written by Mr. Alexander Pope.

Nature and nature's laws lay hid in night,
God said, Let Newton be; and there was
light.

NEWTONIAN PHILOSOPHY, the doctrine of the universe, and particularly of the heavenly bodies; their laws, affections, &c. as delivered by Sir Isaac Newton. The term Newtonian philosophy is applied very differently by different authors. Some, under this philosophy, include all the corpuscular philosophy, considered as it now stands corrected and reformed by the discoveries and

improvements made in the several parts thereof by Sir Isaac Newton. In this sense it is that Gravefande calls his Elements of Physics, an Introduction to the Newtonian Philosophy; and in this sense the Newtonian is the same with the new philosophy, in opposition to the Cartesian, the Peripatetic, and the ancient corpuscular philosophy. Others, by Newtonian philosophy, mean the method or order which Sir Isaac observes in philosophizing, viz. the reasoning and drawing of conclusions directly from phenomena, exclusive of all previous hypotheses; the beginning from simple principles, deducing the first powers and laws of nature from a few select phenomena, and then applying those laws, &c. to account for other things: and in this sense, the Newtonian is the same with the experimental philosophy. Others again, by Newtonian philosophy, mean that wherein physical bodies are considered mathematically, and where geometry and mechanics are applied to the solution of phenomena; in which sense, the Newtonian is the same with the mechanical and mathematical philosophy. Others again, by Newtonian philosophy, understand that part of the physical knowledge which Sir Isaac Newton has handled, improved, and demonstrated in his Principia. And lastly, others, by Newtonian philosophy, mean the new principles which Sir Isaac has brought into philosophy, the new system founded thereon, and the new solutions of phenomena thence deduced; or that which characterizes and distinguishes his philosophy from all others: and this is the sense in which we shall chiefly consider it. As to the history of this philosophy, it was first made public in 1686, by the author, then a fellow of Trinity College, Cambridge; and in the year 1713, republished with considerable improvements. Several other authors have since attempted to make it plainer, by setting aside many of the more sublime mathematical researches, and substituting either more obvious reasonings or experiments; particularly Mr. Whiston, in his Prelect. Phys. Mathem. Gravefande, in his Elem. and Inst. and lately, by the learned Comment of Le Seur and Jacquier upon Sir Isaac's Principia. The philosophy itself is laid down chiefly in the third book of the Principia; the two preceding books being taken up in preparing the way, and laying down such principles of mathematics as have the most relation to philosophy: such are the

the laws and conditions of powers; and these, to render them less dry and geometrical, the author illustrates by scholia in philosophy, relating chiefly to the density and resistance of bodies, the motion of light and sounds, a vacuum, &c.

In the third book he proceeds to the philosophy itself; and from the same principles deduces the structure of the universe, and the powers of gravity, whereby bodies tend towards the sun and planets; and from these powers, the motions of the planets and comets, the theory of the moon and tides. This book, which he calls *De Mundi Systemate*, he tells us, was first wrote in the popular way; but considering that such as are unacquainted with the said principles, would not conceive the force of the consequences, nor be induced to lay aside their ancient prejudices; for this reason, and to prevent the thing from being in continual dispute, he digested the sum of that book into propositions, in the mathematical manner, so as it might only come to be read by such as had first considered the principles; not that it is necessary a man should master them all, many of them, even the first-rate mathematicians, would find a difficulty in getting over. It is enough to have read the definitions, laws of motion, and the three first sections of the first book; after which the author himself directs us to pass on to the book *De Systemate Mundi*.

The great principle on which the whole philosophy is founded, is the power of gravity: this principle is not new; Kepler, long ago, hinted it in his *Introduct. ad Mot. Martis*. He even discovered some of the properties thereof, and their effects in the motions of the primary planets; but the glory of bringing it to a physical demonstration, was reserved to the English philosopher. See *Gravitation*.

His proof of this principle from phenomena, together with the application of the same principle to the various other appearances of nature, or the deducing those appearances from that principle, constitute the Newtonian system; which, drawn in miniature, will stand thus:

1. The phenomena are, 1. That the satellites of Jupiter do, by radii drawn to the center of the planet, describe areas proportional to their times; and that their periodical times are in a sesquialterate ratio of their distances from its center; in which the observations of all astronomers agree. 2. The same phæno-

menon holds of the satellites of Saturn, with regard to Saturn; and of the moon, with regard to the earth. 3. The periodical times of the primary planets about the sun, are in a sesquialterate ratio of their mean distances from the sun. Eur.

4. The primary planets do not describe areas any way proportional to their periodical times about the earth; as being sometimes seen stationary, and sometimes retrograde, with regard thereto. See *Satellite, Period*, &c.

2. The powers whereby the satellites of Jupiter are constantly drawn out of the rectilinear course, and retained in their orbits, respect the center of Jupiter, and are reciprocally as the squares of their distances from the same center. The same holds of the satellites of Saturn, with regard to Saturn; of the moon, with regard to the earth; and of the primary planets, with regard to the sun. See *Central Forces*.

3. The moon gravitates towards the earth, and by the power of that gravity is retained in her orbit: and the same holds of the other satellites with respect to their primary planets; and of the primaries with respect to the sun.

As to the moon, the proposition is thus proved: the moon's mean distance is sixty semidiameters of the earth; her period, with regard to the fixed stars, is twenty-seven days, seven hours, forty-three minutes; and the earth's circumference 123249600 Paris feet. Now, supposing the moon to have lost all her motion, and to be let drop to the earth, with the power which retains her in her orbit, in the space of one minute she will fall $15\frac{1}{2}$ Paris feet; the arch she describes in her mean motion, at the distance of 60 diameters of the earth, being the versed sign of $15\frac{1}{2}$ Paris feet. Hence, as the power, as it approaches the earth, increases in a duplicate ratio of the distance inversely, so as at the surface of the earth it is 60×60 greater than at the moon; a body, falling with that force in our region, must, in a minute's time, describe the space of $60 \times 60 \times 15\frac{1}{2}$ Paris feet, and $15\frac{1}{2}$ Paris feet in the space of one second.

But this is the rate at which bodies fall by their gravity at the surface of our earth; as Huygens has demonstrated by experiments with pendulums. Consequently, the power whereby the moon is retained in her orbit, is the very same we call gravity; for if they were different, a

body

body falling with both powers together would descend with double the velocity, and in a second of time describe $30\frac{1}{8}$ feet. See the articles *Descent* and *Moon*.

As to the other secondary planets, their phenomena, with respect to their primary ones, being of the same kind with those of the moon about the earth, it is argued by analogy, they depend on the same causes; it being a rule or axiom all philosophers agree to, that effects of the same kind have the same causes. Again, attraction is always mutual, that is, the re-action is equal to the action; consequently the primary planets gravitate towards their secondary ones, the earth towards the moon, and the sun towards them all. And this gravity, with regard to each several planet, is reciprocally as the square of its distance from the center of gravity. See *Attraction*.

4. All bodies gravitate towards all the planets, and their weight towards any one planet, at equal distances from the center of the planet, is proportional to the quantity of matter in each. See *Weight*.

For the law of the descent of heavy bodies towards the earth, setting aside their unequal retardation from the resistance of the air, is this, that all bodies fall equal spaces in equal times; but the nature of gravity or weight, no doubt, is the same on the other planets as on the earth.

Suppose, e. gr. such bodies raised to the surface of the moon, and together with the moon deprived at once of all progressive motion, and dropped towards the earth: it is shewn, that in equal times they will describe equal spaces with the moon; and therefore, that their quantity of matter is to that of the moon, as their weight to its weight.

Add, that since Jupiter's satellites revolve in times that are in a sesquuplicate ratio of their distances from the center of Jupiter, and consequently at equal distances from Jupiter, their accelerating gravities are equal; therefore, falling equal altitudes in equal times, they will describe equal spaces; just as in heavy bodies in our earth. And the same argument will hold of the primary planets with regard to the sun, and the powers whereby unequal bodies are equally accelerated, are as the bodies, that is, the weights are as the quantities of matter in the planets, and the weights of the primary and secondary planets towards the

sun, are as the quantities of matter in the planets and satellites. See *Jupiter*.

And hence are several corollaries drawn relating to the weights of bodies on the surface of the earth, magnetism, and the existence of a vacuum. See *Weight* and *Magnet*.

5. Gravity extends itself towards all bodies, and is in proportion to the quantity of matter in each.

That all planets gravitate towards each other, has been already shewn; likewise, that the gravity towards any one, considered apart, is reciprocally as the squares of its distance from the center of the planet; consequently, gravity is proportionable to the matter therein. Further, as all the parts of any planet, A, gravitate towards another planet B, and the gravity of any part is to the gravity of the whole, as the matter of the part to the matter of the whole; and re-action equal to action: the planet B will gravitate towards all the parts of the planet A; and its gravity towards any part will be to its gravity towards the whole, as the matter of the part to the matter of the whole. Hence we derive the methods of finding and comparing weights of bodies towards different planets; of finding the quantity of matter in the several planets, and their densities; since the weights of equal bodies, revolving about planets, are as the diameters of their orbits directly, and as the squares of the periodical times inversely; and the weights at any distance from the center of the planet are greater or less in a duplicate ratio of their distances inversely: and since the quantities of matter in the planets are as their powers at equal distances from their centers: and lastly, since the weights of equal and homogeneous bodies towards homogeneous spheres are, at the surfaces of the spheres, as the diameters of those spheres; consequently, the densities of heterogeneous bodies are as the weights at the diameters of the spheres.

6. The common center of gravity of the sun and all the planets is at rest; and the sun, though always in motion, yet never recedes far from the common center of all the planets.

For the matter in the sun being to that in Jupiter as 1033 to 1; and Jupiter's distance from the sun to the semidiameter of the sun in a ratio somewhat bigger; the common center of gravity of Jupiter and the sun will be a point a little without the sun's surface; and by the same means,

means, the common center of Saturn and the sun will be a point a little within the sun's surface; and the common center of the earth, and all the planets, will be scarce one diameter of the sun distant from the center thereof: but the center is always at rest; therefore, though the sun will have a motion this and that way, according to the various situations of the planets, yet it can never recede far from the center; so that the common center of gravity of the earth, sun, and planets, may be esteemed the center of the whole world. See the article *Planet*.

7. The planets move in ellipses that have their foci in the center of the sun, and describe areas proportionable to their times. This we have already laid down, *à posteriori*, as a phenomenon; and now that the principle of the heavenly motions is shewn, we deduce it therefrom *à priori*. Thus, since the weights of the planets towards the sun are reciprocally as the squares of their distances from the center of the sun; if the sun were at rest, and the other planets did not act on each other, their orbits would be elliptical, having the sun in the common umbilicus, and would describe areas proportionable to the times; but the mutual actions of the planets are very small, and may be well thrown aside. See *Orbit*.

Indeed the action of Jupiter on Saturn is of some consequence; and hence, according to the different situation and distances of those two planets, their orbits will be a little disturbed. The earth's orbit too is sensibly disturbed by the action of the moon; and the common center of the two describes an ellipsis round the sun placed in the umbilicus; and, with a radius drawn to the center of the sun, describes areas proportionable to the times. See *Earth, Orbit, &c.*

8. The aphelia and nodes of the planets are at rest, excepting for some inconsiderable irregularities arising from the action of the revolving planets and comets. Consequently, as the fixed stars retain their position to the aphelia and nodes, they too are at rest. See the article *Nodes, &c.*

9. The axis, or polar diameter of the planets, is less than the equatorial diameter.

The planets, had they no diurnal rotation, would be spheres, as having an equal gravity on every side: but by this rotation the parts receding from the axis endeavour to rise towards the equator, which, if the matter they consist of be

fluid, will be affected very sensibly. Accordingly Jupiter, whose density is found not much to exceed that of water on our globe, is observed by astronomers to be considerably less between the two poles than from the east to west. And, on the same principle, unless our earth were higher at the equator than towards the poles, the sea would rise under the equator, and overflow all near it. But this figure of the earth Sir Isaac Newton proves likewise *à posteriori*, from the oscillations of pendulums being slower and smaller in the equinoctial, than in the polar parts of the globe. See *Earth*.

10. All the moon's motions, and all the inequalities of these motions, follow from these principles, e. gr. her unequal velocity, and that of her nodes and apogee in the syzygies and quadratures; the differences in her eccentricity and her variation. See *Moon*.

11. From the inequalities of the lunar motions, we can deduce the several inequalities in the motions of the satellites.

12. From these principles, particularly the action of the sun and moon upon the earth, it follows, that we must have tides, or that the sea must swell and subside twice every day. See *Tide*.

13. Hence, likewise, follows the whole theory of comets, as that they are above the region of the moon, and in the planetary spaces; that they shine by the sun's light, reflected from them; that they move in conic sections, whose umbilici are in the center of the sun; and, by radii drawn to the sun, describe areas proportional to the times; that the orbits or trajectories are very nearly parabolas; that their bodies are solid, compact, &c. like those of the planets, and must therefore acquire an immense heat in their perihelia; that their tails are exhalations arising from and encompassing them like atmospheres. See *Comet*.

Mr. Pope, in his Essay on Man, has the following lines:

Superior beings, when of late they saw
A mortal man unfold all Nature's law,
Admir'd such wisdom in a human shape,
And shew'd a Newton as we shew an ape.

NICHE, in architecture, a hollow sunk into a wall, for the commodious and agreeable placing of a statue. The ordinary proportion of a niche is to have two circles in height and one in width; but M. Le Clerc makes their height something more, the excess being to compensate

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penfate for the height of the pedeftal of the ftatue. The hollow is femicircular at bottom, that is, in its plan; and at top it terminates in a kind of canopy. Niches have frequently an impoft, and an archivolt or head band, and the canopy wrought and enriched in the manner of a fhell. The breadth of the archivolt may be made equal to a fixth or feventh part of the niche, and the height of the impoft to a fifth or fixth part of the fame: and the impoft and archivolt ought to confift of fuch mouldings as have fome relation to the architecture of the place. Niches are fometimes made with ruffic-work, fometimes with fhell-work, and fometimes of cradle or arbour-work. Niches are fometimes made fquare, but thefe want all the beauty of the others.

NICOTIANA, in botany, a plant more commonly known by the name of tobacco.

NICTITATING Membrane, in comparative anatomy, a thin membrane, chiefly found in the bird and fih-kind, which covers the eyes of thefe animals, fheltering them from the duft, or too much light; yet is fo thin and pellucid, that they can fee pretty well through it.

NIDUS, among naturalifts, fignifies a neft, or proper repository for the eggs of birds, infefts, &c. wherein the young of thefe animals are hatched and nurfed.

NIECE, a brother or fifters daughter, which in the civil law, is reckoned the third degree of confanguinity.

* **NIGER**, a large river of Africa, faid to have its fource near that of the Nile. Some fay it runs from E. to W. through the middle of Negroeland, difcharging itfelf into the Atlantic ocean by three channels; the moft fouthery of which is called Rio-Grande, that in the middle Gambia, and that on the N. Senega. But this is mere conjecture; for after feveral trials that have been made of the two laft of thefe rivers, the channels have not been found deep enough to go up very far into the country, though they have failed fartheft up the Senega.

NIGHT, the part of the natural day during which the fun is underneath the horizon; or that fpace wherein it is dufty. See *Day*.

Night was originally divided by the Hebrews, and other eastern nations, into three parts, or watchings. The Romans, and afterwards the Jews from them, divided the night into four parts, or watches,

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the firft of which began at fun-fet and lafted till nine at night, according to our way of reckoning; the fecond lafted till midnight; the third till three in the morning; and the fourth ended at fun-rife. The ancient Gauls and Germans divided their time not by days but by nights; and the people of Iceland and the Arabs do the fame at this day. The like is alfo obferved of our Saxon anceftors.

NIGHT MARE, in medicine, a difeafe called by phyficians ephialtes and ineptus.

* **NILE**, a large river of Egypt in Africa, which rifes in Abyffinia, is about eight degrees N. latitude. It runs generally from S. to N. through Abyffinia, Senna, and Nubia into Egypt in one ftream, till it comes below Cairo to the Delta, where it divides into feveral branches, the two principal of which difcharge themfelves into the Mediterranean, the one at Damietta, and the other at Rofetta. There are great rejoicings every year in Egypt, when the Nile rifes to a certain height, becaufe their future harveft depends upon it. The inundation generally continues from the 20th of July to the beginning of November, at which time the dry land begins to appear; if it can be called dry after it has been fo long soaked in the water. As foon as the land is fit they fow their corn, and in April it becomes yellow and fit for reaping. When the water is let into the great canal, it is conveyed from thence into refervoirs and cifterns, to be diftributed into their fields and gardens. But we fhould have obferved, that all the low wet places are fowed with rice, which grows beft in the water. This overflowing of the Nile is owing to the great rains, which fall annually between the tropics upon the high mountains of Abyffinia, near which the fource of the Nile is, and from which the water falls down in great torrents into that river. The Nile does not contain a great number of fifh, perhaps becaufe there are fo many crocodiles and other voracious animals. The water, where it is clear, is very fit for drinking.

* **NINEVEH**, an ancient city of Affyria. It was enlarged by Ninus, who fome take to be the Nimrod of Mofes. When Jonas went to preach againft it, he was faid to be three days in paffing through it. It was a long while the capital of the Affyrian empire, but is now ruined, and
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it is difficult to find the place where it stood.

* **NIOBE**, in fabulous history, the daughter of Tantalus, and wife of Amphiön, king of Thebes. She was a princess of great beauty; but being the mother of seven sons and seven daughters, she had the presumption to prefer herself to Latona, who had only Apollo and Diana. Latona in revenge caused Apollo and Diana to kill Niobe's fourteen children with their arrows, the former slaying the sons, and the latter the daughters. On which Niobe being filling with the deepest grief, Jupiter, in compassion to her incessant tears, turned her into a stone.

NIPPERS, in the martège, are four teeth in the fore part of the horse's mouth, two in the upper, and two in the lower jaw. A horse puts them forth between the second and third year.

NIPPERS is also an instrument in use among smiths and farriers, being a kind of pincers, wherewith in shoeing a horse, they cut the nails before they rivet them. It is also used in taking off a shoe.

NIPPLES, *Papillæ*, in anatomy. See *Breast*.

NISI PRIUS, in law, a judicial writ lying in cases where the jury being impannelled and returned before the justices of the bank, one of the parties requests to have such a writ, for the ease of the country, that the trial may come before the justices in the same county on their coming thither. These trials by nisi prius are intended for the ease of the country, by saving the parties, jurors, and witnesses, the trouble of coming to Westminster. The purport of a writ of nisi prius is, that the sheriff is thereby commanded to bring to Westminster the men impannelled, at a certain day before the justices, *nisi prius iusticiarii domini regis ad assisas capiendas venerint*; that is, unless the justices go before the day into such a county to take assizes. See *Justices*.

NITRE, or **SALTPETRE**, a neutral salt, formed by the coalition of the common vegetable fixed alkaline salt with a peculiar acid: of a sharp, penetrating, cooling taste: soluble in eight times its weight of very cold water, in less than thrice its weight of water temperately warm, and in one third its weight of boiling water.

The origin of nitre, or rather of the acid which makes the characteristic part

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of nitre, is unknown. Thus much only is known with certainty, that common waters, both atmospherical and subterraneous, often contain a little of this acid in combination with earthy or other bodies, so as to yield, by crystallization, on supplying the vegetable fixed alkali, a perfect nitre: and that when animal or vegetable substances, mixed with porous absorbent earths, have lain exposed to the air till they are thoroughly rotted, they are found in like manner to contain a small portion of nitrous acid, so as to give out a little nitre to water, on being supplied with the proper alkaline basis. On this foundation, some nitre is prepared in different parts of Europe; but the greatest quantities are the produce of the East-Indies: the means by which it is there so plentifully obtained, or whether it is a natural production, have not yet, so far as we can learn, been revealed. Nitre, as brought into the shops, has generally a greater or less admixture of sea-salt, from which it is purified, by dissolving it in boiling water, and, after duly evaporating the filtered solution, setting it in a cold place to crystallize. This salt is one of the principal medicines of the antiphlogistic class; of general use in disorders accompanied with inflammatory symptoms, whether chronical or acute, and as a corrector of the inflammation or irritation produced by stimulating drugs. Hoffmann thinks it has an advantage above the refrigerants of the acid kind, in not being liable to coagulate the animal juices; solutions of it mingling with or dissolving recent thick blood, and in some degree preserving it from coagulation, as well as corruption; at the same time changing its colour, when dark or blackish, to a crimson; an effect which it produces also, in a less degree, upon the fleshy parts of dead animals. It retards likewise the coagulation of milk, but seems, from Stahl's account, to increase the consistence of thin serous humours; for he observes, that when used in gargarisms for inflammations of the fauces in acute fevers, it thickens the salival fluid into a mucus, which keeps the parts moist for a considerable time; whereas, when nitre is not added, a dryness of the mouth presently ensues. This medicine generally promotes urine, and often gives relief in stranguries and heat of urine, whether simple, or proceeding from a venereal taint. It sometimes

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loosens the belly, particularly in hot dispositions: in cold phlegmatic temperaments it rarely has this effect, though given in very large doses, even to an ounce: the diarrhæas of acute diseases, and fluxes in other circumstances, from an acrimony of the bile or inflammation of the intestines, have been frequently restrained by it. In high fevers it often promotes a diaphoresis or sweat; in malignant fevers, where the pulse is low, and the strength greatly depressed, it impedes that salutary excretion and the eruption of the exanthemata, in consequence of its general power of diminishing inflammation and heat. It seems to be prejudicial in disorders of the lungs, though some have ventured to prescribe it in hemoptyses.

The usual dose of nitre, among us, is from two or three grains to a scruple; though in many cases it may be given with great safety, and to better advantage, in larger quantities.

Nitre may be commodiously taken in the form of troches; one part of the purified salt is commonly ground with three parts of fine sugar, and the mixture made up with mucilage of gum tragacanth. In this and all other solid forms it is accompanied, however, with one inconvenience, being liable, especially when the dose is considerable, to occasion a pain or uneasiness at the stomach, which can be prevented only by plentiful dilution. A liquid form is therefore, in general, the most eligible, and may be easily rendered grateful by a proper addition of sugar: commonly half an ounce of nitre, and two ounces of fine sugar, with a scruple of cochineal, as a colouring material, are boiled in two pints and a half of water, till half a pint is wasted, and after standing to settle, the clear purplish red liquor poured off for use. The boiling serves only to hasten the solution, and need not be continued longer than till the salts are dissolved, and a sufficient colour extracted from the cochineal.

NOBILITY, a quality that enables and raises a person above the rank of a commoner. The origin of nobility in Europe is by some referred to the Goths; who, after having seized a part of Europe, rewarded their captains with titles of honour, to distinguish them from the common people. In Britain the term nobility is restrained to degrees of dignity above knighthood: but every where else nobility and gentility are the same. The

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British nobility consists only of five degrees, viz. that of a duke, marquis, earl, viscount, and baron, each of which see under their proper articles. In Britain and Ireland these titles are only conferred by the king, and that by patent, in virtue of which it becomes hereditary. The privileges of the nobility are very considerable: they are all esteemed the king's hereditary counsellors, and are privileged from all arrests, unless for treason, felony, breach of peace, condemnation in parliament, and contempt of the king. They enjoy their seats in the house of peers by descent, and no act of parliament can pass without their concurrence: they are the supreme court of judicature, and even in criminal cases give their verdict upon their honour, without being put to their oath. In their absence they are allowed a proxy to vote for them, and in all places of trust are permitted to constitute deputies, on account of the necessity the law supposes them under of attending the king's person: but no peer is to go out of the kingdom without the king's leave, and when that is granted, he is to return with the king's writ, or forfeit goods and chattles.

NOBLE, a money of account, containing six shillings and eight pence. The noble was anciently a real coin, struck in the reign of Edward III. and then called the penny of gold; but it was afterwards called a rose-noble, from its being stamped with a rose: it was current at 6 s. 8 d.

NOCTAMBULI, *Noctambulones*, *Somnambuli*, such persons as arise and walk about in their sleep. The disorder consists in this, that the proper organs of muscular motion are at liberty, while those destined for sensation are bound up, or inactive. Certain ideas follow upon certain motions of the fibres of the brain, and certain motions of those fibres upon certain ideas. By much thinking on any one thing, the fibres acquire some permanent situation, which gives a freer passage to the spirits towards a certain part of the body than ordinary. If then the animal spirits become too copious, too much agitated, or consist of parts too solid, they throw themselves into the next passages they find open, glide into the nerves and muscles corresponding to these passages, and there produce the motions proper to those muscles. The bilious, melancholic, and sanguine, are most subject to those nocturnal vagaries. The remedies are all such things as temper

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per the agitation of the spirits and relax the fibres, as bleeding, and all coolers, either internally or externally exhibited: aperitives too have a good effect; but the best remedy, according to some, is the cold bath.

NOCTILUCA, in physiology, a species of phosphorous, so called because it shines in the night without any light being thrown upon it; such as the phosphorous made of urine.

NOCTURNAL, relating to the night, in contradistinction to diurnal.

NOCTURNAL ARCH, in astronomy, the arch of a circle described by the sun, or star in the night.

Semi-NOCTURNAL arch of the Sun, that portion of a circle he passes over between the lower part of our meridian, and the point wherein he sets, or the point of the horizon wherein he rises.

NOCTURNAL, *Noctulabium*, an instrument chiefly used at sea, to take the altitude or depression of some stars about the pole, to find the latitude and hour of the night: Some nocturnals are hemispheres, or planispheres, on the plane of the equinoctial. Those commonly in use among seamen are two; the one adapted to the polar star, and the first of the guards of the little bear; the other to the pole star, and the pointers of the great bear.

NODE, *Nodus*, in surgery, a tumour arising on the bones, and usually proceeding from some venereal cause; being much the same with what is otherwise called exostosis. See *Exostosis*.

This word is more particularly applied to the tumours or protuberances arising on the joints of old gouty people, called also tophi.

Some give the denomination of nodes, to all tumours formed by a coagulation of visciduous matter in the external parts of the body.

NODES, in astronomy, the two points where the orbit of a planet intersects the ecliptic.

Such are the two points C and D (plate xxxvi. fig. 1.) of which the node C, where the planet ascends northward above the plane of the ecliptic, is called the ascending node, or the dragon's head, and is marked thus ☊. The other node D, where the planet descends to the south, is called the descending node, or the dragon's tail, marked thus ☋. And the right line D C is called the line of the nodes.

NODULE, or **NODULUS**, a word

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used in pharmacy, for a knot tied in a rag, and including some medicinal ingredients to be suspended in any liquor, as beer or wine, to give it a tincture, or the like.

It signifies also a parcel of odoriferous simples, tied up in a piece of silk, for the patient to be frequently smelling to.

NODUS, or **NODE**, in dialling, a certain point or pole in the gnomon of a dial, by the shadow whereof, either the hour of the day in dials without furniture, or the parallels of the sun's declination, and his place in the ecliptic, &c. in dials with furniture, are shewn.

NODUS is also used for a hole in the ceiling of a room, or in the window, for making of a dial on the floor, wall, or the like.

NOLI ME TANGERE, *Touch me not*, in medicine, a malignant eruption, in the face, occasioned by a sharp corrosive humour; thus called, either because it affects those who touch it, or because the more it is touched, the worse it grows, and the farther it spreads.

NOMADES, in antiquity, a name given to several nations or people, whose whole occupation was to feed their flocks, and who had no fixed place of abode, but were constantly shifting, according to the conveniences of pasturage.

NOMBRIL POINT, in heraldry, the next below the fess-point, or the very center of the escutcheon.

NOMENCLATURE, *Nomenclatura*, a catalogue of several of the more usual words in any language, with their significations, compiled to facilitate the use of such words to those who are to learn the tongue: such are our Latin, Greek, French, &c. nomenclatures.

NOMINATION, the act of naming and appointing a person for some function, employ, or benefice.

NOMINATION, in law, the power that a person has of appointing a clerk to a patron of a benefice, by him to be presented to the ordinary.

NOMINATIVE, in grammar, the first case of the nouns which are declinable.

NOMINATOR, one who presents a person to an office or benefice; whence the person named, or presented, is called nominee.

NON-ABILITY, in law, incapacity, or an exception taken against a plaintiff, in a cause, on some just ground, why he cannot commence a suit in law; as his being attainted of felony, outlawry, &c.

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NON-AGE, in law, all the time a person continues under the age of one-and-twenty; but in a special sense it is all the time a person is under the age of fourteen.

NON-APPEARANCE, a default in not appearing in a court of judicature. Attornies subscribing warrants for appearing in court, are liable to attachment and fine for non-appearance. If a defendant does not appear, and find bail upon a *scire facias* and rule given, judgment may be had against him.

NON COMPOS MENTIS, in law, denotes a person's not being of sound memory and understanding. Of these persons there are four different kinds, an idiot, a madman, a lunatic who has lucid intervals, and a drunkard who deprives himself of reason by his own act and deed. In all these cases, except the last, one that is non compos mentis shall not lose his life for felony or murder; but the drunkard has no indulgence on account of the loss of his reason, for, in the eye of the law, his drunkenness does not extenuate but aggravate his offence.

NON-NATURALS, in medicine, so called because by their abuse they become the causes of diseases.

Physicians have divided the non-naturals into six classes, viz. the air, meats and drinks, sleep and watching, motion and rest, the passions of the mind, the retentions and excretions.

NON-RESIDENCE, applied particularly to spiritual persons, who wilfully absent themselves for the space of one month together, or two months at different times in the year, from their benefices; for which they are liable to penalties, by the statute of non-residence: but bishops, the king's chaplains, &c. are excepted.

NON-SUIT, the dropping of a suit or action, or a renouncing thereof by the plaintiff or defendant, which happens most commonly upon the discovery of some error in the plaintiff's proceedings, when the cause is so far proceeded in, that the jury is ready at the bar to deliver in their verdict. A non suit, it is said, may be in the following cases, viz. where a person brings a personal action, and does not prosecute it with effect; or if, upon the trial, he refuses to stand a verdict, then he becomes non-suited; so where the plaintiff is not ready for trial at the calling and swearing of the jury, it is presumed he does not stand to proceed in his cause, and on that account

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the court may call him non-suited. Likewise, on a trial, when the jury comes in to deliver their verdict, and when the plaintiff is called on to hear the same, in that case, if he does not appear after being thrice called by the crier of the court, he is non-suited; which non-suit is to be recorded by the secondary, by the direction of the court: but if he afterwards appears, before the non-suit is actually recorded, the court may take the verdict, for that is not a non-suit, till it be recorded, upon motion made by the counsel for this purpose; and then it is a part of the record, in the nature of a judgment against the plaintiff.

NONCONFORMISTS, the same with dissenters.

NONES, *Nonæ*, in the Roman calendar, the fifth day of the months January, February, April, June, August, September, November, and December; and the seventh of March, July, and October. March, May, July, and October had six days in their nones; because these alone, in the ancient constitution of the year by Numa, had thirty-one days apiece, the rest having only twenty-nine, and February thirty; but when Cæsar reformed the year, and made other months contain thirty-one days, he did not allot them six days of nones.

* **NORFOLK**, a county of England, bounded on the N. and E. by the German Ocean; by Suffolk on the S. and by the wastes and fens of Lincolnshire, and the Isle of Ely on the W. It is 50 miles in length from E. to W. and 30 in breadth from N. to S. Its soil in some places is fat, and in some sandy. Towards the sea it is level, and yields plenty of corn, and pasture. In other parts, there are woods and heaths, which maintain a great many sheep. Its principal rivers are the Ouse, Waveney, Yare and Thyrne. Its commodities are corn, wool, honey, and saffron, and its manufactures worsted stockings and Norwich Stuffs, and on the sea coasts are taken abundance of herrings. This county has several good harbours, and in general is well inhabited, there being 660 parish churches, one city, and 27 market towns. Norwich is the city.

* **NORMANDY**, a considerable province of France, with the title of a duchy: it is separated from England by the British Channel, and is bounded on the S. by Beaufe, Perche, and Maine; on the W. by Brittany, and on the E. by Picardy

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Picardy and the isle of France. Its extent from E. to W. is 150 miles, and from N. to S. 75. This province is very fertile. They have large meadows and good pastures, which serve to fatten a great number of cattle. They brag of the oxen of the territory of Auge; the veal and sweetmeats of Roan; the sheep and rabbits of Cabour; the fowls of Caux and Bessin, and of their partridges with red bills. The sea yields numbers of excellent fish, and they make a great deal of white salt in several places, which they use to salt butter, of which they sell a large quantity. There are mines of iron in several places, of which they make great guns, bombs, bullets, pots, and great quantities of iron ware. The rivers of this province are the Seine, the Eure, the Aure, the Iton, the Andelle, the Rille, the Dive, the Carantonne, the Ant, the Orne, and the Drome. It is very populous, for it comprehends a great number of towns and villages.

NORROY, the title of the third of the three kings at arms.

NORTH, in cosmography, one of the four cardinal points. See *Compass*.

* **NORTHAMPTON**, the shire town of Northamptonshire. It has a market on Saturdays; and 8 fairs, on February 20, for horses, horned cattle, and toys; April 15, May 4, and August 5, are great horse-fairs; August 26 is for all sorts of merchandize; September 19, chiefly for cheese and sheep; and November 28 and December 19, for all sorts of cattle. It is seated on the river Nen, over which it has two bridges, and had walls which are now demolished; as also a large castle, which is ruined likewise. It had seven churches, which are now reduced to four, and the great one, called Allhallows, stands in the middle of the town, and is adorned with a handsome portico. It was in a great measure destroyed by fire in 1675, but was soon rebuilt, with a spacious market-place, and is a well built handsome town, where the assizes and quarter-sessions are held; and it sends two members to parliament. It has a good free-school, two alms houses, an infirmary, and a gaol. It is 50 miles W. of Cambridge, 30 S. E. of Coventry, 32 S. of Leicester, and 66 N. W. by N. of London. Long. 0. 55. W. Lat. 52. 15. N.

* **NORTHAMPTON**, battle near. Notwithstanding the adherents of the house of York were dispirited and dispersed by the proclamation of a free par-

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don published by Henry VI. soon after the battle at Bloreheath in 1459, the malecontent lords still entertained hopes of raising to the throne the duke of York; but queen Margaret, who exerted herself to frustrate every attempt of that kind, kept a strict eye upon all their proceedings. The famous earl of Warwick was governor of Calais, an employment she resolved to deprive him of, and therefore sent her favourite the duke of Somerset to supersede him; but Somerset met with such a warm reception, as obliged him to land in another place, from which he marched to Guisnes, and there he sent out detachments to skirmish with the garrison of Calais, by whom his men were generally repulsed to their quarters. Warwick was so beloved by the nation in general, that when Somerset had landed with his troops, the sailors steered the ships directly into the harbour of Calais. The queen being determined to wrest the government of this fortress from the hands of her enemies, equipped a fleet for the assistance of Somerset, and ordered a considerable body of troops to be put on board, under the command of Lord Rivers and his son Sir Anthony Widville. While the fleet lay in the harbour of Sandwich, waiting for a wind, the earl of Warwick having received intelligence of their destination, manned the ships which had lately deserted to him, and embarking some troops with Sir John Denham, they sailed to Sandwich, where they surprized Rivers, and all his officers, who were conveyed to Calais, together with their ships, the sailors themselves favouring the enterprise. Warwick being thus reinforced with shipping, sailed for Ireland, in order to consult with the duke of York, about the measures to be taken for another insurrection in England, where the people espoused their cause, and their friends expected them with impatience. The duke agreed with him in opinion, that the lords at Calais should make a descent among their adherents, and well-wishers in the county of Kent, and proceed directly to the capital, which, they did not doubt, would receive them with open arms. The earl of Warwick in his return to Calais, fell in with the English fleet commanded by the duke of Exeter, who had lately superseded him in the post of admiral, and been sent out to intercept him in his passage. But the sailors and soldiers on board the duke's squadron refusing to fight against their old

old commander, he, in order to prevent a total revolt, sailed into Dartmouth, where the greatest part of his men deserted for want of pay and provision. The queen and the ministry did not doubt but the interview between the duke of York and the earl of Warwick, would produce a new rebellion, which in order to weaken by anticipation, the council resolved to set on foot an exact inquisition in all the towns and counties in the kingdom, for the discovery and punishment of all the partizans of the malecontents; the earl of Wiltshire and the lord Scales were vested with a commission to make this enquiry, and punish all those who had carried arms for York, and his adherents, in the late rebellion, and they began to execute their powers with great severity, in some towns which openly favoured the lords of the opposition. Of all the counties in England, Kent had the greatest cause to dread the resentment of the court, for it had always expressed a particular attachment to the duke of York, and the conduct of the inhabitants under Cade was not forgotten: believing therefore, that their ruin was inevitable, if not prevented by some vigorous resolution, they sent an intimation to the lords at Calais, assuring them, that if they would land in Kent, the inhabitants would receive them with open arms, and hazard their lives and fortunes in their service. Sir Simon Montfort had been detached by Margaret with a body of fresh forces to guard Sandwich and other harbours that lay next the enemy, and ships had been equipped for conveying the duke of Somerset to England, where his presence was thought necessary by the council. But Warwick surprized this armament, pillaged the town of Sandwich, took Montfort, and carried the ships to Calais. It was during this short expedition, that he became acquainted with the state of affairs in England, the knowledge of which, together with the invitation of the Kentish men, determined him and his associates to land without delay. Nothing was wanting but a sum of money to purchase necessities, and the earl of Warwick borrowed on his own credit eighteen thousand pounds from the merchants of the staple. Thus supplied, he began to make preparations, and in the mean time sent over his uncle the lord Falconbridge to Kent, where he was joined by a great number of people belonging to that and the adjacent counties. He was soon followed by Warwick him-

self, with the earls of March and Salisbury, who landed, where they were met by Thomas Beuchier archbishop of Canterbury, the lord Cobham, and other persons of distinction. Before they set sail from Cadiz, they dispersed a manifesto in England, assuring the nation, that their sole motive for taking arms, was to deliver the people from the oppression under which they groaned, and to secure their liberties and privileges; towards the re-establishment of which they solicited the assistance of all true-hearted Englishmen. They had informed the duke of York of their intended operations, and the day on which they set sail for England. They brought over about fifteen hundred men, who being reinforced by four thousand under the lord Cobham, they began their march towards London, and such numbers joined them in their rout, that they entered the city in triumph, with an army of forty thousand men devoted to their service. Mean while the queen was not idle at Coventry. She had endeavoured to prevent their being received in London, by sending thither the lord Scales with a strong body of forces, but he was refused admittance by the mayor, even before the arrival of the malecontents, and threw himself into the tower, from whence he threatened to cannonade the city, should the magistrates admit the rebels; to these menaces, however, they paid no regard. Margaret still continued to assemble her forces, until her army being completed, she bestowed the joint command of it upon the dukes of Somerset and Buckingham, though the latter was in effect the general; and issued out all the orders in the name of Henry, who was there in person. As soon as the young earl of March understood that he was advancing towards London, he left the earl of Salisbury with good part of his troops in that capital, and marched out with the earl of Warwick, at the head of twenty five thousand men, to attack her before her army should be increased. The two parties met in the neighbourhood of Northampton, after the queen had passed a river by which they were divided. Before they proceeded to battle, the associated lords sent the bishop of Salisbury to the king, with a message intreating his majesty would suspend his indignation, and join with them in some salutary measures to prevent the effusion of English blood. This address was looked upon as a mere terg-

money to serve appearances, and being rejected as such, both sides prepared for an engagement. On the nineteenth day of July 1460, the malecontents drew up their army in order of battle, the earl of Warwick commanded the right wing, the lord Cobham conducted the left, and the earl of March took his station in the center. The royal army was commanded by the dukes of Somerset and Buckingham, the queen remained at a little distance, from whence she could observe the particulars of the action, and give her directions according to the emergency of the occasion, and Henry stayed in his tent, waiting the event of a battle on which the fate of his crown depended. The Yorkists having published orders through their army to respect the king's person, and spare the common soldiers; but to give no quarters to the officers, proceeded to the attack about two o'clock in the afternoon, and the action beginning with great fury on both sides, continued till seven in the evening, when the lord Grew of Ruthwain, who commanded a considerable part of Henry's army, suddenly revolted to the rebels. This unexpected defection, threw the rest of the king's forces into such consternation, that they forthwith began to give ground, and were routed with great slaughter. The duke of Buckingham, the earl of Shrewsbury (son to the famous Talbot) the lord Beaumont, and many other persons of distinction were killed upon the spot. The queen, the prince of Wales, and the duke of Somerset fled with such precipitation, that they did not halt until they reached Durham. Henry fell into the hands of the victors, who treated him with all the exterior respect due to their sovereign, and this deference in some measure consoled him for the mischance of the day, which would have rendered him a very great object of compassion, had not his natural indolence and want of sensibility, fortified him against the vicissitudes of fortune. He was immediately conducted to Northampton, with all the marks of honour and regard, and after a short stay in that place, repaired to London surrounded by a crowd of noblemen and others, who had so lately appeared against him in the field of battle. Mean time the queen who did not think herself safe at Durham, retired privately to Wales, in order to elude the search of her enemies, but she soon quitted that retreat, and with her son took refuge in Scotland. Immediately after the king's ar-

rival in London, the tower surrendered for want of provisions, and the lord Scales who acted as governor, attempting to go by water in disguise to the sanctuary at Westminster, was discovered and assassinated by the watermen.

* **NORTHAMPTONSHIRE**, a county of England, 51 miles in length, and 30 in breadth, bounded on the E. by Huntingdonshire, with part of Bedfordshire and Buckinghamshire; on the N. by Leicestershire and Rutlandshire; on the W. by Warwickshire, and on the S. by Oxfordshire and Buckinghamshire. It contains 14260 houses, 18600 inhabitants, 136 parishes, 13 market-towns, and sends nine members to parliament, two for Northampton, two for Peterborough, two for Brackley, one for Higham-Ferrers, and two for the county. The principal rivers are the Ouse, the Nen, the Welland, the Cherwell, and the Larn. It is a healthful sporting country, containing a great number of gentlemen's seats, and the soil is fertile in corn and grass. The productions are much as in the other inland counties, but there is less waste land, and there are three forests, and several parks.

* **NORTHUMBERLAND**, a county of England, bounded on the N. by Scotland, on the E. by the German Sea, on the S. by the county of Durham, and on the W. by Cumberland and part of Scotland. It is in the diocese of Durham, and is about 143 miles in circumference, containing 46 large parishes, and 12 market-towns, of which Newcastle upon Tyne is the chief. The air of this county is sharp and piercing. They have great plenty of pit-coal in this county. It is but thinly inhabited, it being for the most part rough, hilly, and barren; but in some parts near the sea, where it is manured with sea-weeds, it produces tolerably well. The chief riches of this county is the pit-coal.

* **NORWAY**, a kingdom of the most western part of Scandinavia, and is bounded on the N. and W. by the ocean, on the E. by Swedish Lapland, and on the S. by the Categate sea, which separates it from Denmark. It is divided into Norway Proper, and its dependencies. The dependencies of Norway are, Iceland, and the isle of Ferro. It is a cold barren country, and the ground is covered with snow for nine months in the year. It is full of woods and mountains, and produces oak-planks, deal-boards, pitch and tar, besides iron and copper-mines. The summer is very

short, but then they sow and reap in six weeks time, and yet it does not produce corn sufficient for the natives, and those that come hither for trade. They have a very great fishery, and dry their cod upon the rocks, without salting it, which is well known by the name of stock-fish, and is sent all over Europe. It had its own kings till the year 1387, when it was united to Denmark, and in 1525 the inhabitants embraced the Lutheran religion. It has a viceroy, who has an absolute power, and lives at Berghen. The people are robust, courageous, inured to labour, and good sailors.

NORWICH, a city of Norfolk, and one of the largest in England, with three markets, on Wednesdays, Fridays, and Saturdays; and three fairs, on the day before Good-friday, on the Saturday before Whitsunday, and on the Saturday after for hore-s, sheep, lambs, and petty chapmen. It is a handsome, well frequented populous city and noted for its stuff manufactory called Norwich crape. It is seated on the river Yare, which parts it in two, over which there are several bridges. It is about a mile and a half in length, and nearly the same in breadth; and is surrounded with a wall, except on the side of the river, through which there are twelve gates. It has a very stately cathedral, beautified with a lofty spire steeple. There are upwards of 34 parish churches within the walls; however, some of them are but mean. The whole extent within the walls is not inhabited, for there are many orchards and gardens where there are no houses. It is a county of itself, and is governed by a mayor, recorder, 24 aldermen, a steward, two sheriffs who are justices of the quorum, and six common-councillmen. The members of parliament are elected by the freemen and freeholders. The castle which stands upon a mount within the city, is now turned into a common prison. It is 27 miles W. by N. of Yarmouth, and 109 N. E. by N. of London. Long. 1. 25. E. Lat. 52. 40. N.

NOSE, *Nasus*, in anatomy. The external parts are the root of the nose, the arch, the back, or spine of the nose, the sides of the nose, the tip of the nose, the alæ, the external nares, and the part under the septum. The internal parts are the internal nares, the septum narium, the circumvolutions, the conchæ superiores, the conchæ inferiores, the posterior openings of the internal nares, the sinus frontales, sinus maxillares,

sinus sphenoidales, the ductus lachrymales, and ductus palatini. The firm or hard parts are mostly bony, and the rest cartilaginous; to these we may add the periosteum and perichondrium. The soft parts are the integuments, muscles, sacculus lachrymalis, membrana pituitaria, vessels, nerves, and hairs of the nares.

Bleeding at the Nose. See *Hæmorrhage*.

NOTARY, *Notarius*, a person, usually some scrivener, who takes notes, or frames short draughts of contracts, obligations, charter-parties, or other writings. At present a notary public, is he who publicly attests deeds or writings, in order to make them authentic in another nation: but he is principally employed in business concerning merchants, in making protests of bills of exchange, &c. And noting a bill, is where he goes to take notice of a merchant's refusal to accept or pay the same.

NOTATION, in arithmetic and algebra, the method of expressing numbers or quantities by signs or characters, appropriated for that purpose.

NOTE, *Nota*, is used for a character or abbreviation, serving to denote or express something in a little compass.

NOTE, in music, a character which marks the sound, that is, the elevation and falling of the voice, and the swiftness and slowness of its motions. In general under notes are comprehended all the signs or characters used in music, though in strict propriety the word only implies the marks which denote the degrees of gravity and acuteness to be given to each sound.

NOTE is likewise used for a mark made in a book or writing where there occurs something remarkable and worthy of particular notice: as also for an observation or explication of some passage in an author added in the margin, or at the bottom of the page, by an editor, in which sense it stands contradistinguished to text. The notes make the principal difference in the editions of classic, &c. authors. We have Virgil, Horace, Terence, &c. with Dacier's notes; Dauphin's notes; notes variorum; Shakespeare, with Hämmer's, Warburton's, and Johnson's notes, &c.

NOTE is also a minute or short writing containing some article of business, in which sense we say promissory note, note of hand, bank note, &c.

NOTHE COSTÆ, in anatomy, the five lowest ribs on each side. They are called bastard or spurious ribs, in regard they

they do not join with the breast-bone as the other ribs do; nor are they, like the rest, bony, but cartilaginous.

NOTICE, in law, the making of something known, which a man might be ignorant of before; and it has divers effects in our laws; for, thereby the party giving the same, may reap a benefit which he otherwise should not have had; and by this means the person to whom it is given, is liable to some charge or action, to which without it he had not been subject.

NOION, in logic, an idea or representation of any thing in the mind.

*** NOTTINGHAM**, the chief town of Nottinghamshire, is large, populous, and delightfully seated on a rock, the foot of which is washed by the river Leam, which at a mile distance falls into the Trent. It has two markets, on Wednesdays and Saturdays; and 4 fairs, on Friday after January 13, May 7, the Thursday before Easter, for horses and horned cattle; and October 2, 3, and 4, for the same, and vast quantities of cheese, &c. It contains 3 parishes, it has 6 meeting-houses, with handsome streets, well-built houses, and a very spacious market-place. It had a strong castle which stood on a steep rock, and on the ruins is a handsome palace belonging to the late duke of Newcastle. Its principal manufacture is in woove stockings, though they make a great deal of malt and earthen ware. Heavy goods are brought up hither from London by sea, and thence up the Trent, and many coal-pits within 3 or 4 miles of the town, afford plenty of fuel, at little expence. It is governed by a mayor, a recorder, 6 aldermen, 2 sheriffs, 18 common-council, 2 chamberlains, and 2 coroners, and sends 2 members to parliament. It is 16 miles E. of Derby, and 125 N by W. of London. Long. 1. 5. W. Lat. 52. 58. N.

*** NOTTINGHAMSHIRE**, a county of England, bounded on the W. by Derbyshire and part of Yorkshire; on the N. by Yorkshire; on the S. by Leicestershire, and on the E. by Lincolnshire. It is about 120 miles in circumference, containing 168 parishes, and 9 market-towns. It has a wholesome air; but with a different soil; for the S. E. part being best watered with rivers, is most fruitful in corn and grass. The western part, wherein is the forest of Sherwood, noted for the story of Robin Hood, who resided therein, is well stocked with

wood, wherein is plenty of game and pit-coal. This is called the sandy part, as the former is the clay. It is about 38 miles in length from N. to S. and 19 in breadth from E. to W. The principal rivers are the Trent and Idle.

NOVATIANS, a Christian sect which sprang up in the third century, so called from Novatian, a priest of Rome, or Novatus, an African bishop, who separated from the communion of pope Cornelius, whom Novatian charged with a criminal lenity towards those who had apostatized during the persecution of Decius. He denied the church's power of remitting mortal sins, upon the offender's repentance; and at last went so far as to deny that the apostates could ever hope for pardon even from God himself. Novatus coming to Rome, joined with the followers of Novatian, and added to these rigid doctrines another, which was the unlawfulness of second marriages, against which this became as severe as against apostates; denying communion to such as married a second time after baptism, and treating widows who married again, as adulteresses. The two leaders were proscribed and declared heretics, not for excluding penitents from communion, but for denying that the church had the power of remitting sins.

NOVEL, in matters of literature, a fictitious history of a series of surprizing and entertaining events in common life, wherein the rules of probability are or ought to be strictly preserved; in which it differs from a romance, where the hero and heroine is some prince and princess, and the events which lead to the catastrophe, are in general highly absurd, improbable, and unnatural.

NOVEL ASSIGNMENT, in law, an assignment of time, place, or the like, in an action of trespass, otherwise than it was before assigned.

NOVEMBER, in chronology, the eleventh month of the Julian year, consisting only of thirty days: it got the name of November, as being the ninth month of Romulus's year, which began with March.

NOVICE, a person not yet skilled or experienced in any art or profession.

NOUN, *Nomen*, in grammar, a name or word expressing the thing spoken of, as king, queen, prince, &c. Besides the particular name which each person bears, he gives himself another when he speaks of himself, as I or myself; the former are called nouns, and the latter pronouns.

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Nouns are again divided into noun substantive, and nouns adjective. They are called substantives, when the objects they express are considered simply in themselves, as soul, body, &c. and adjectives, when their objects are considered as clothed with any qualities, as vicious soul, corrupt body, &c. Nouns are also divided into proper and appellative; nouns proper are those which express a particular thing or person, so as to distinguish it from all others of the same kind, as Aristotle, &c. Nouns appellative are those common to several individuals of the same kind, as man, beast, fish, &c.

* **NUBIA**, a kingdom of Africa, bounded on the N. by Egypt, on the E. by the Red sea, and on the S. by the desert of Goshara and a part of Negroeland. It is seated in between 13 and 24 degrees of latitude. It is 660 miles long from S. to N. and 600 broad from W. to E. It produces a great quantity of sugar, which is very brown, and they have gold, civet, sanders-wood, ivory, horned cattle, camels, lions, tigers, and crocodiles. The air is very hot, and whenever the small pox gets among them, it rages like a plague. There are mountains which run on each side of the Nile, and along the gulph of Arabia. The chief rivers are the Nile, the Nahr al Abiad, or the White River, which falls into the Nile, and the Atbara, that enters it on the E. Nubia is divided into two kingdoms, Dongola and Sennar; whereof the first lies on the N. and the other to the S. The chief towns in the kingdom of Dongola are Ibrim, on the S. of the Nile towards Egypt; Masho, on the W. of the Nile; Argos, over-against the former on the other side of the Nile, Dongola, Dungala, or Dankala is the capital.

NUCIFEROUS, in botany, is applied to such trees as bear nuts.

NUCLEUS, the kernel of a nut, or even any seed inclosed within a husk. The term nucleus is also used for the body of a comet, otherwise called its head.

NUDITIES, in painting and sculpture, those parts of an human figure not covered with any drapery; or those parts where the carnation appears.

NUL-TIEL RECORD, in law, is what the plaintiff generally pleads on the defendant's pleading matter of record in bar of the action brought by the plaintiff.

NUM

NULLITY, in law, any thing that is null or void: thus there is a nullity of marriage, where persons marry within the degrees, or where infants marry without consent of their parents or guardians.

NUMBER, *Numerus*, in arithmetic, an assemblage of several units, or things of the same kind.

Broken NUMBERS are the same with fractions. See *Fractions*.

Cardinal NUMBERS, those which express the quantity of units, as 1, 2, 3, 4, &c. whereas ordinal numbers are those which express order, as 1st, 2d, 3d, &c.

Compound NUMBER, one divisible by some other number besides unity; as 12, which is divisible by 2, 3, 4, and 6. Numbers, as 12 and 15, which have some common measure besides unity, are said to be compound numbers among themselves.

Cubic NUMBER is the product of a square number by its root: such is 27, as being the product of the square number 9, by its root 3. All cubic numbers whose root is less than 6, being divided by 6, the remainder is the root itself: thus $27 \div 6$ leaves the remainder 3, its root; 216, the cube of 6, being divided by 6, leaves no remainder; 343 the cube of 7, leaves a remainder 1, which, added to 6, is the cube root; and 512, the cube of 8, divided by 6, leaves a remainder 2, which, added to 6, is the cube root. Hence the remainders of the divisions of the cubes above 216, divided by 6, being added to 6, always gives the root of the cube so divided, till that remainder be 5, and consequently 11, the cube-root of the number divided. But the cubic number above this being divided by 8, there remains nothing, the cube-root being 12. Thus the remainders of the higher cubes are to be added to 12, and not to 6; till you come to 18, when the remainder of the division must be added to 18; and so on *ad infinitum*.

Determinate NUMBER is that referred to some given unit, as a ternary or three: whereas an indeterminate one is that referred to unity in general, and is called quantity.

Homogeneous NUMBERS are those referred to the same unit; as those referred to different units are termed heterogeneous.

Whole NUMBERS are otherwise called integers. See *Integers*.

Rational NUMBER is one commensurable with unity; as a number, incommensurable

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incommensurable with unity, is termed irrational or a surd. See *Surd*.
In the same manner a rational whole number is that whereof unity is an aliquot part; a rational broken number, that is equal to some aliquot part of unity; and a rational mixed number, that consisting of a whole number and a broken

Even NUMBER, that which may be divided into two equal parts, without any fraction, as, 6, 12, &c. The sum, difference, and product of any number of even numbers, is always an even number.

An evenly even NUMBER, is that which may be measured, or divided, without any remainder, by another even number, as, 4 by 2.

An unevenly even NUMBER, when a number may be equally divided by an uneven number, as 10 by 5.

Uneven NUMBER, that which exceeds an even number, at least by unity, or which cannot be divided into two equal parts, as 3, 5, &c.

The sum or difference of two uneven numbers makes an even number; but the factum of two uneven ones makes an uneven number.

If an even number be added to an uneven one, or if the one be subtracted from the other, in the former case the sum, in the latter the difference, is an uneven number; but the factum of an even and an uneven number is even.

The sum of any even number of uneven numbers is an even number, and the sum of any uneven number of uneven numbers is an uneven number.

Primitive or Prime NUMBERS, are those only divisible by unity, as 5, 7, &c. And prime numbers among themselves are those which have no common measure besides unity, as 11 and 19.

Perfect NUMBER, that whose aliquot parts, added together, make the whole number, as 6, 28; the aliquot parts of 6 being 3, 2, and 1 = 6; and those of 28, being 14, 7, 4, 2, 1, = 28.

Imperfect NUMBERS, those whose aliquot parts, added together, make either more or less than the whole. And these are distinguished into abundant and defective; an instance in the former case is 12, whose aliquot parts 6, 4, 3, 2, 1, make 16; and in the latter case 16, whose aliquot parts, 8, 4, 2, and 1, make but 15.

Plain NUMBER, that arising from the multiplication of two numbers, as 6,

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which is the product of 3 by 2; and these numbers are called the sides of the plain.

Square NUMBER, the product of any number multiplied by itself; thus 4, which is the factum of 2 by 2, is a square number.

Every square number added to its root makes an even number.

Polygonal, or Polygonous NUMBERS, the sums of arithmetical progressions beginning with unity: these, where the common difference is 1, are called triangular numbers; where 2, square numbers; where 3, pentagonal numbers; where 4, hexagonal numbers; where 5, heptagonal numbers, &c. See *Polygonal*.

Pyramidal NUMBERS. The sums of polygonous numbers, collected after the same manner as the polygons themselves, and not gathered out of arithmetical progressions, are called first pyramidal numbers: the sums of the first pyramidal are called second pyramidal, &c.

If they arise out of triangular numbers, they are called triangular pyramidal numbers; if out of pentagons, first pentagonal pyramidal.

NUMBER, in grammar, a modification of nouns, verbs, &c. to accommodate them to the varieties in their objects, considered with regard to number.

When a noun indicates an object considered as single, or alone, or a number of them considered as united together, it is said to be of the singular number, as a plant, an army, a church. When it indicates several objects, and those as distinct, it is of the plural number, as plants, armies, churches: and when I speak of myself as making a part of several others, instead of saying I, it is proper to say we, &c.

NUMBERS, in poetry, oratory, music, &c. certain measures, proportions, or cadences, which render a verse, period, or song, agreeable to the ear.

Poetical numbers consist in a certain harmony in the order, quantities, &c. of the feet and syllables, which make the piece musical to the ear, and fit for singing, for which all the verses of the ancients were intended.

Book of NUMBERS, the fourth book of the Pentateuch, taking its denomination from its numbering the families of Israel. A considerable part of this book is historical, relating to several remarkable passages in the Israelites march through the wilderness. It contains a distinct relation of their several movements from one place to another, or their two and forty stages.

stages through the wilderness, and many other things, whereby we are instructed in some of the weightiest truths that have immediate reference to God and his providence in the world. But the greatest part of this book is spent in enumerating those laws and ordinances, whether civil or ceremonial, which were given by God, but not mentioned before in the preceding books.

NUMERAL LETTERS, those letters of the alphabet which are used for figures.

NUMERALS, in grammar, those words which express numbers.

NUMERATION, *Numeratio*, in arithmetic, the art of estimating or pronouncing any number.

The characters whereby numbers are ordinarily expressed are the nine following, 1, 2, 3, 4, 5, 6, 7, 8, 9.

That these nine numerical notes may express not only units, but also tens, hundreds, thousands, &c. they have a local value given them; so that when either alone, or when placed in the right-hand place, they denote units; in the second place tens; in the third, hundreds; in the fourth, thousands, &c.

NUMERATOR of a Fraction. See *Fraction*.

NUMERICAL, **NUMEROUS**, or **NUMERAL**, something belonging to numbers.

NUMISMATOGRAPHIA, a term used for the description and knowledge of ancient medals and coins, whether of gold, silver, or brass.

NUN, a woman, in several Christian countries, who devotes herself, in a cloister or nunnery, to a religious life. There were women in the ancient Christian church, who made public profession of virginity before the monastic life was known in the world, as appears from the writings of Cyprian and Tertullian. These, for distinction's sake, are sometimes called ecclesiastical virgins, and were commonly enrolled in the canon or matricula of the church. They differed from the monastic virgin chiefly in this, that they lived privately in their father's houses, whereas the others lived in communities; but their profession of virginity was not so strict as to make it criminal in them to marry afterwards, if they thought fit. As to the consecration of virgins, it had some things peculiar in it: it was usually performed publicly in the church by the bishop. The virgin made a public profession of her resolution, and then the bishop put upon her

the accustomed habit of sacred virgins. One part of this habit was a veil called the *sacrum velamen*; another was a kind of mitre or coronet worn upon the head. At present, when a woman is to be made a nun, the habit, veil, and ring of the candidate are carried to the altar, and she herself, accompanied by her nearest relations, is conducted to the bishop, who, after mass and an anthem, the subject of which is "that she ought to have her lamp lighted, because the bridegroom is coming to meet her," pronounces the benediction: then she rises up, and the bishop consecrates the new habit, sprinkling it with holy-water. When the candidate has put on her religious habit, she presents herself before the bishop, and sings on her knees, *ancilla Christi sum*, &c. then she receives the veil, and afterwards the ring, by which she is married to Christ; and lastly, the crown of virginity. When she is crowned, an anathema is denounced against all who shall attempt to make her break her vows. The several orders of nuns in the Romish and Greek churches, are mentioned under their respective articles.

NUNCIO, or **NUNTIO**, an ambassador from the pope to some Catholic prince or state, or a person who attends on the pope's behalf at a congress, or an assembly of several ambassadors.

NUNCUPATIVE WILL, denotes a last will or testament, only made verbally, and not put in writing.

NUPTIAL RITES, the ceremonies attending the solemnization of marriage.

* **NUREMBERG**, a city of Germany, in the circle of Franconia, and capital of a territory of the same name. It is seated in a sandy barren plain, yet the inhabitants are so industrious that they have rendered it a very flourishing place. It is about seven miles in circumference, and surrounded with high walls, flanked with 380 towers, after the old way of fortification. The river Pegnitz runs through it, and divides it in two, and turns ninety wheels belonging to mills and other machines, and has twelve bridges over it, by which both parts of the town communicate with each other. There are 130 streets, which are large and well paved, and the houses are generally built of hewn stone, six stories high. Though Nuremberg is so large a place, it has properly but two parish churches, which are both built in the Gothic taste. The arsenal is one of the best furnished of any in Germany, having arms for 10,000

men,

men, with 300. pieces of cannon. The town-house is very large, with a beautiful front. The number of the inhabitants is said to be 40,000, who are governed by an aristocracy, by whom justice is very impartially administered. The inhabitants are very ingenious and skilful in all sorts of arts, of which their geographical maps, copper-plates, mathematical and musical instruments, are a proof, as well as their works in steel, ivory, alabaster, and wood. Most of those curious toys, which are brought into England, and called Dutch toys, are made at this place. Their religion is the Lutheran, and there is only one church allowed to the Roman catholics. It is situated almost in the center of Germany, 55 miles N.W. of Ratibon, and 20 W. by N. of Franconia. Long. 11. 12. E. Lat. 49. 41. North. *Quod dicitur de*
NURSERY, or NURSERY, GARDEN, a piece of land set apart for the raising and propagating of all sorts of trees and plants to supply the garden and other plantations. In this sort there are great numbers in different parts of this kingdom; but particularly in the neighbourhood of London, which are occupied by the gardeners; whose business it is to raise trees, plants, and flowers for sale; and in many of these there is at present a much greater variety of trees and plants cultivated than can be found in any other part of Europe. In France, their nurseries (which are but few, when compared with those in England) are chiefly confined to the propagation of fruit-trees, from whence they have the appellation of pépinière; (there is scarce any) of those gardens, where a person can be supplied either with ever-greens, flowering shrubs, or forest-trees. And in Holland, their nurseries are principally for flowers; some few of them indeed propagate tender exotic plants. But those nurseries in the neighbourhood of London, in general include all these; and from hence most of the curious persons abroad are supplied with furniture for their gardens. But I do not propose, in this place, to treat of these extensive nurseries, or to give a description of them; therefore shall confine myself to treat of such nurseries only as are absolutely necessary for all lovers of planting to have upon the spot, where they design to make their plantation: for if these are large, the expence of carrying a great number of trees, if the distance is great, will be no small article, besides the hazard of their grow-

ing: which, when plants have been trained up in good land, and removed to an indifferent one, is very great. Therefore it is of the utmost consequence to every planter, to begin by making of a nursery. But in this article I must beg leave to observe, that a nursery should not be fixed to any one particular spot: I mean by this, that it would be wrong to continue the raising of trees any number of years upon the same spot of ground; because hereby the ground will be so much exhausted by the trees as to render it unfit for the same purpose. Therefore all good nursery-gardeners shift and change their land, from time to time; for when they have drawn off the trees from a spot of ground, they either plant kitchen-herbs, or other things upon the ground for a year or two, by which time, as also by dunging and trenching of the land, it is recovered and made fit to receive other trees. But this they are obliged to from necessity, being confined to the same land; which is not the case with those gentlemen who have a large extent of ground in the country. Therefore all such persons I would advise to make nurseries upon the ground which is intended for planting, where a sufficient number of the trees may be left standing, after the others have been drawn out, to plant in other places; which, for all large growing trees, but particularly such as are cultivated for timber, will be found by much the most advantageous method; for all those trees which come up from the seed, or which are transplanted very young into the places where they are designed to remain, will make a much greater progress, and become larger trees than any of those which are transplanted at a greater age. Therefore the nurseries should be thinned early, by removing all those trees which are intended for other plantations, while they are young; because hereby the expence and trouble of staking, watering, &c. will be saved, and the tree will succeed much better. But in exposed situations, where there are nurseries made, it will be necessary to permit the trees to stand much longer, that, by growing close together, they may shelter each other, and draw themselves up: and these should be thinned gradually, as the trees advance; for, by taking away too many at first, the cold will check the growth of the remaining trees. But those trees which are taken out from these nurseries, after a certain age, should not

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be depended on for planting; and it will be prudent rather to consign them for fuel, than by attempting to remove them large, whereby, in endeavouring to get them up with good roots, the roots of the standing trees will be often much injured.

What has been here proposed, must be understood for all large plantations in parks, woods, &c. but those nurseries which are only intended for the raising of ever-greens, flowering-shrubs, or plants which are designed to embellish gardens, may be confined to one spot, because a small compass of ground will be sufficient for this purpose. Two or three acres of land, employed this way, will be sufficient for the most extensive designs; and one acre will be full enough for those of moderate extent. And such a spot of ground may be always employed for sowing the seeds of foreign trees and plants; as also, for raising many sorts of biennial and perennial flowers to transplant into the borders of the pleasure-garden; and for raising many kinds of bulbous-rooted flowers from seeds, whereby a variety of new sorts may be obtained annually, which will recompense for the trouble and expence, and will moreover be an agreeable diversion to all those persons who delight in the amusements of gardening.

Such a nursery as this should be conveniently situated for water; for where that is wanting, there must be an expence attending the carriage of water in dry weather. It should also be as near the house as it can with conveniency be admitted, in order to render it easy to visit at all times of the year; because it is absolutely necessary, that it should be under the inspection of the master; for unless he delights in it, there will be little hopes of success. The soil of this nursery should also be good, and not too heavy and stiff; for such land will be very improper for sowing most sorts of seeds; because, as this will detain the moisture in the spring and winter, so the seeds of most tender things, especially of flowers, will rot in the ground, if sown early. Therefore, where persons are confined to such land, there should be a good quantity of sand, ashes, and other light manures buried, in order to separate the parts, and pulverise the ground; and if it is thrown up in ridges, to receive the frost in winter, it will be of great use to it; as will also the frequent forking or stirring of the ground, both before and after it is planted.

NUT

NUSANCE, in law, a thing done to the annoyance of another. Nuisances are either public or private: a public nuisance is an offence against the public in general, either by doing what tends to the annoyance of all the king's subjects, or by neglecting to do what the common good requires; in which case all annoyances and injuries to streets, highways, bridges, and large rivers; as also disorderly ale-houses, bawdy-houses, gaming-houses, stages for rope-dancers, &c. are held to be common nuisances. A private nuisance is when only one person or family is annoyed, by the doing of any thing; as where a person stops up the light of another's house, or builds in such a manner that the rain falls from his house upon his neighbour's; as likewise the turning or diverting water from running to a man's house, mill, meadow, &c. stopping up a way that leads from houses to lands; suffering a house to decay, to the damage of the next house; erecting a brew-house in any place not convenient; or an house of office, &c. so near another person's house as to offend him by its smell. Indictment lies for a public or common nuisance at the king's suit, whereon the party offending shall be fined and imprisoned; but no action can be brought in this case, except one man suffers more by a common nuisance than another; as where a pit is dug in the highway, and he falls into it. Action on the case, or assise of nuisance, lies for any private nuisance, at the suit of the party aggrieved, and on such actions judgment is given that the nuisance should be removed, and the injured party recover damages; but if a person has only a term of years in a house or lands, as he has no freehold therein, he can only have an action on the case, by which the nuisance will be removed without his recovering damages.

NUT, *Nux*, among botanists, denotes a pericarpium of an extraordinary hardness, inclosing a kernel or seed. Of these there are several kinds, as filberts, walnuts, &c.

NUTMEG, *nux moschata*, in natural history, the kernel of a large nut, produced by a tree said to resemble the pear-tree, growing in the East Indies. The outer part of the fruit is a soft fleshy substance like that of the walnut, which spontaneously opens when ripe: under this lies a red membrane called mace, forming a kind of reticular covering, through the fissures of which is seen the hard

N U X

hard woody shell that includes the nutmeg. Two sorts of this kernel are distinguished; one of an oblong figure, called male; the other roundish, or of the shape of an olive, called female; this last is the officinal species, being preferred to the other on account of its stronger and more agreeable flavour, and its being, as is said, less subject to become carious. The nutmegs are cured, according to Rumphius, by dipping them in a somewhat thick mixture of lime and water, that they may be every where coated with the lime; which contributes to their preservation.

The nutmeg is a moderately warm, grateful, unctuous spice; supposed to be particularly useful in weakness of appetite, and the nausea and vomitings accompanying pregnancy, and in fluxes; but liable, when taken too freely, to fit very uneasy on the stomach, and, as is said, to affect the head. Roasted with a gentle heat, till it becomes easily friable, it proves less subject to these inconveniences, and is supposed likewise to be more useful in fluxes.

Two kinds of sebaceous matter, said to be expressed from the nutmeg, are distinguished in the shops by the name of oil of mace; the best sort, brought from the East Indies in stone jars, is somewhat soft, of a yellow colour, and of a strong agreeable smell, greatly resembling that of the nutmeg itself: the other comes from Holland in solid masses, generally flat, and of a square figure, of a paler colour, and much weaker smell. These oils are employed chiefly externally in stomachic plasters, and in atodyne and neryine unguents and liniments. They appear to be a mixture of the gross sebaceous matter of the nutmeg with a little of the essential or aromatic oil; both which may be perfectly separated from one another by maceration or digestion in rectified spirit, or by distillation with water. The spirituous residue, and the distilled water, and the essential oil, are nearly similar to those drawn from the nutmeg itself, the pure white sebaceous substance being left behind.

NUTRITION, *Nutritio*, in the animal economy, the accession or apposition of new parts to the body, similar to those it already consisted of, either for its augmentation, or the reparation of such as are worn off.

NUX VOMICA, a flat, compressed, round fruit, about the breadth of a shil-

N Y M

ling, brought from the East Indies. It is a certain poison to dogs, cats, &c. and doubtless it would also prove fatal to mankind: its surface is not much corrugated, and its texture is firm like horn, and of a pale, greyish, brown colour.

NYCTHEMERON, *nykthemeron*, the natural day, or day and night, which together always make twenty-four hours.

NYCTALOPIA, in medicine, a twofold disorder of the eye, one of which is opposite to the other. In the first, the sight is best in the night, and in obscure places; whereas, in a clear light, their sight fails, so that they can hardly see anything. In the other sort of nyctalopia, the patient can see nothing at all except in a clear and bright light. As these infirmities arise from a natural bad formation of the eye, they are therefore incurable.

NYCTANTHES, Arabian jasmine, in botany, a genus of plants.

NYMPH, in mythology, an appellation given to certain inferior goddesses, inhabiting the mountains, woods, waters, &c. said to be the daughters of Oceanus and Tethys.

NYMPH, among naturalists, that state of winged insects between their living in the form of saw-worm, and their appearing in the winged or most perfect state.

The eggs of insects are first hatched into a kind of worms, or maggots, which afterwards pass into the nymph state, surrounded with shells or cases of their own skins; so that, in reality, these nymphs are only the embryon insects, wrapped up in this covering, from whence they at last get loose, though not without great difficulty.

During the nymph state, their creature loses its motion. Swammerdam calls it *nymphea aurelia*, or simply *aurelia*; and others give it the name of *chrysalis*, a term of the like import. See *Chrysalis*.

NYMPHÆ, in anatomy, two membranaceous parts, situated on each side the rimæ. They are of a red colour, and cavernous structure, somewhat resembling the wattles under a cock's throat.

They are sometimes smaller, sometimes larger, and are continuous to the prepuce of the clitoris, and joined to the inferior side of the labia.

NYMPHÆA, the water-lily, in botany, a genus of plants.

NYMPHS, in fabulous history, terrestrial deities, of which there were various

M in mythology of kinds,

N Y M

kinds, all of whom are supposed to be daughters of Oceanus and Tethys, and were distinguished into Nereids, Naiades, Dryades, Hamadryades, Orcades, Eimniades, &c. There were also celestial nymphs, who were the attendants of the superior deities. Those of both kinds

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were represented as young and beautiful virgins, and dressed suitably to the character ascribed to them. The nymphs were probably derived from the poets personifying the various parts of nature, and giving a voice and features to the fountains, hills, groves, and rivers.

O.

O A K

O, The fourth vowel, and fourteenth letter of the English alphabet.

The Greeks had two *o*'s, viz. Omicron (*o*) and Omega (*ω*); the first pronounced upon the tip of the lips with a sharper sound, and the other in the middle of the mouth, with a fuller sound, equal to *oo* in our language. The long and short pronunciations of our *o* are equivalent to the two Greek ones; the first, as in *suppose*; the second, as in *obey*.

O, among the ancients, was a numeral letter, signifying eleven; and when a dash was added at the top, thus, *Ō*, it signified eleven thousand.

OAK, a tree well known. It is one of the principal materials in building ships, &c. being strong in all positions. All the sorts of oaks, says Mr. Miller, are propagated from acorns, which should be sown as soon as possible after they are ripe; for if they are kept too long out of the ground, they seldom grow.

The manner of sowing these acorns, if designed for a small plantation, or to be removed, is to prepare some beds of fresh earth, neither too strong and heavy, nor too light and dry: in these beds you should place the acorns in rows one foot asunder, and about two inches distance in the rows, covering them about two inches thick with the same fresh earth; observing to leave none of them uncovered, to entice the vermin, which may, in a short time, destroy all the seeds.

In the spring, when the plants begin to appear, you must carefully clear them from weeds; and if the season proves dry, you should refresh them now and then with a little water, which will greatly promote their growth. In these beds the plants should remain until the following autumn, observing constantly to keep them clear from weeds; at which

O A K

time you should prepare a spot of good fresh earth, in size proportionable to the quantity of plants, which should be trenched and levelled: then towards the middle or latter end of October, you should carefully take up the plants, so as not to injure their roots, and plant them out in rows three feet asunder, and eighteen inches distance plant from plant; observing never to suffer the plants to abide long out of the ground, because their roots would dry, and endanger the growth of the plants.

When they are planted, you should lay a little mulch upon the surface of the ground, near their roots, to prevent the earth from drying too fast; and if the season should prove very dry, you should give them a little water to settle the earth to their roots.

When the plants have taken root in this nursery, they will require little more care than to keep them clear from weeds, and dig the ground between the rows every spring; in doing of which, you should cut off such roots as extend very far from the trunk of the trees, which will render them better for transplanting again: you should also prune off such side branches as extend themselves very far, and would retard the upright shoot; but you should by no means cut off all the small lateral branches, some of which are absolutely necessary to be left on, to detain the sap for the augmentation of the trunk; for I have often observed, where trees have been thus closely pruned, that their heads have overgrown their bodies, so that they have bent downward, and become crooked.

When these trees have remained in the nursery three or four years, they will then be large enough to transplant to the places where they are to remain; for it is not proper to let them grow very large before

before they are planted out; because these are very hazardous trees to remove when old, or after they have taken deep root.

The season for this work is, as I said before, in the autumn, at which time, if they are carefully taken up, there will be little danger of their succeeding. When they are planted, the surface of the ground should be mulched about their roots, to prevent its drying too fast; and if the season is very dry, they should be watered, to settle the earth to their roots, which may be repeated two or three times in very dry weather; but you must carefully avoid giving them too much water, which is very injurious to these trees, when newly removed.

You should also shake them, to prevent their being shaken and disturbed by the winds, which would retard their rooting. In transplanting of these trees, you should by no means cut their heads, which is too much practised: all that should be done, must be only to cut off any bruised or ill-placed branches, which should be taken off close to the place where they are produced: but there can be no greater injury done to these trees than to shorten their roots; for when the leading bud, which is absolutely necessary to draw and attract the nourishment, is taken off, the branch often decays entirely, or at least, down to the next vigorous bud.

The trees, thus raised and managed, will, if planted in a proper soil, grow to a considerable magnitude, and are very proper for a wilderness in large gardens, or to plant in clumps in parks, &c. but if they are designed for timber, it is much the better method to sow the acorns in the places where they are to remain; in order to which, you should provide yourself in autumn with a sufficient quantity of acorns, which should be always taken from straight, upright, vigorous-growing trees; these should be gathered from under the trees as soon as may be after they are fallen, and, if possible, in a dry time, laying them thin in some open room to dry; after which they may be put in dry sand, and preserved in a dry place until the end of November, when you should prepare the ground for planting them.

The directions here given are designed only for small plantations in a garden or park, which are only for pleasure: but where these trees are cultivated with a view to profit, the acorns should be sown where the trees are designed to grow; for

those which are transplanted will never grow to the size of those which stand where they are sown, nor will they last near so long sound: for in some places, where these trees have been transplanted with the greatest care, and they have grown very fast for several years after, yet they are now decaying, when those which remain in the place where they came up from the acorns are still very thriving, and have not the least sign of decay: therefore, whoever designs to cultivate these trees for timber, should never think of transplanting them, but sow the acorns on the same ground where they are to grow; for the timber of all those trees which are transplanted is not near so valuable as that of the trees from acorns. *Miller's Gardener's Dictionary.*

OAK Leaf Galls. These are of several kinds; the remarkable species, called the mushroom gall, is never found on any other vegetable substance but these leaves; and, besides this, there are a great number of other kinds, all of them being the niduses of certain insects.

OAT, in husbandry, a grain, of which there are several species, as the black, red, white, &c. and which are cultivated in the following manner.—Black oats are commonly sown upon an etch crop, or on a lay, which they plough up in January, when the earth is moist, taking care to turn the turf well, and to lay it even and flat. Oats are to be sown earlier in the northern parts of England than in the southern. Oats are sown with a broad cast, at twice, as they do barley, harrowing it well in; but this must always be harrowed the same way that the furrows lie of a lay, or but very little crows, for fear of raising the turf; but upon an etch, as soon as the land is ploughed on an edge, they sow and harrow it in once; then sow it a second time, the full quantity, and harrow it five or six times over, observing to harrow it once or twice across, which breaks the clods, and covers the seed better than harrowing all one way. They commonly sow them upon a broad ridge, which they give the land but one ploughing for. The usual time for sowing black oats is, in the beginning of February, or a very few weeks later, sometimes not till the beginning of March: they are a hardy grain, and will bear any thing of wet or cold. Four bushels of seed is the quantity for an acre; but they grow best upon a moist land, though they will not miss any where. The farmer knows

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that his oats are ripe when the stalks turn yellow, the grain feels hard, and the hulk begins to open, and shew the feed. After they are cut they should lie for the dew and the rain to plump them, and make them thresh well; and if weedy, to kill the weeds: but, if there happen much rain, they must be got in again as soon as dry; otherwise the oats will soon fall out of the husks, and great part of the crop be lost. Red oats is a kind of corn very common in Staffordshire, and some of the northern counties; it is a sort of naked oat, and is very proper for making oat-meal because the kernel threshes out of the hull, without carrying it to the mill, or drying of it. This oat is cultivated in the same manner as barley. White oats is commonly sown upon an etch, after wheat, rye, or barley; they only give the land one ploughing, and sow them, and harrow them, as they do the black oats, except the land is subject to weeds; in that case, it is good to plough up the wheat or rye stubble in November, which will make it rot the better, and be a kind of winter fallowing. Only, if you have a very dry burning ground, which black oats will not delight in, they often in that case sow them upon a lay. March and April are the usual time of sowing white oats, and the drier the weather is when they are sown, the better; they grow best upon a dry, gravelly, or sandy land, and they are the best of all to be sowed upon a land very subject to weeds, because, being sowed late, they allow a very little ploughing, and growing very thick after this, they over-top the weeds sooner than any other plant. White oats generally yield about the same quantity as those of the black, that is, about twenty bushels from an acre. *Mortimer's Husbandry.*

Wild OAT, in husbandry, a kind of oat, or oat-grass, which springs up without sowing, and is much hated and dreaded by the farmers. This, in many counties of England, is the greatest of all hindrances of the good crops of barley, and often of other grain. It is a rough and hairy oat, and usually black. In the wetter years, and after much frost, this is found to be most troublesome. The best remedy the farmer has against this, is, to sow the land most apt to produce it with beans, and when they are come up to about three inches high, to turn in sheep upon the ground, about twenty sheep to an acre; these will eat up all the shoots of the wild oat, and not touch the

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beans so long as there is any of the oat-shoots left. *Mortimer's Northampton.*

OATH, *Juramentum*, a solemn affirmation, in which the persons sworn invoke the Almighty to witness that their testimony is true, renouncing all claim to his mercy, and calling for his vengeance if it be false.

OBADIAH, or *the Prophecy of OBADIAH*, a canonical book of the Old Testament, contained in one single chapter, and is partly an invective against the cruelty of the Edomites, who mocked and derided the children of Israel, as they passed into captivity, and with other enemies, their confederates, invaded and oppressed those strangers, and divided the spoil amongst themselves: and partly a prediction of the deliverance of Israel, and of the victory and triumph of the whole church over her enemies.

OBELISK, in architecture, a truncated, quadrangular, and slender pyramid, raised as an ornament, and frequently charged either with inscriptions or hieroglyphics. Obelisks appear to be of very great antiquity, and to be first raised to transmit to posterity precepts of philosophy, which were cut in hieroglyphical characters: afterwards they were used to immortalize the great actions of heroes, and the memory of persons beloved. The first obelisk mentioned in history was that of Rameses, king of Egypt, in the time of the Trojan war, which was forty cubits high. Phius, another king of Egypt, raised one of forty-five cubits; and Ptolemy Philadelphus, another of eighty-eight cubits, in memory of Arsinoe. Augustus erected one at Rome in the Campus Martius, which served to mark the hours on an horizontal dial, drawn on the pavement. They were called by the Egyptian priests the fingers of the sun, because they were made in Egypt also to serve as styles, or gnomons, to mark the hours on the ground. The Arabs still call them Pharaoh's needles, whence the Italians call them *aguglia*, and the French *signilles*. The proportions in the height and thickness are nearly the same in all obelisks; their height being nine, or nine and a half, and sometimes ten times their thickness; and their diameter at the top never less than half, and never greater than three-fourths of that at the bottom.

OBELISK, †, in grammar, a mark in form of a dagger, used to refer the reader to a note in the margin, or bottom of a page.

OBJECT, in philosophy, something apprehended,

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apprehended, or presented to the mind, by sensation or by imagination.

OBJECT is also used for the matter of art or science, or that about which it is employed; in which sense it also coincides with subject.

OBJECT-GLASS of a *Telescope* or *Microscope*, the glass placed at the end of the tube which is next the object.

OBIT, among Christians, a funeral solemnity, or office for the dead, most commonly performed when the corpse lies in the church uninterred. It likewise signifies the anniversary office, or annual commemoration of the dead, performed yearly on the day of their death, with prayers, alms, &c.

OBLATION, a sacrifice, or offering made to God.

OBLIGATION, any act whereby a person becomes bound to another, to do something; as to pay a sum of money, be surety, or the like.

OBLIQUE, in geometry, something oblique, or that deviates from the perpendicular. Thus an oblique angle is either an acute, or obtuse one, i. e. any angle except a right one.

OBLIQUE ASCENSION, in astronomy. See *Ascension*.

OBLIQUE CASES, in grammar, are all the cases except the nominative.

OBLIQUE LINE, that which, falling on another line, makes oblique angles with it, viz. one acute, and the other obtuse.

OBLIQUE PERCUSSION, in mechanics. See *Percussion*.

OBLIQUE PLANES, in dialling, are those which recline from the zenith, or incline towards the horizon. The obliquity, or quantity of this inclination, or reclinatation, may be found by means of a quadrant.

OBLIQUE SAILING, in navigation, is when a ship sails upon some rhumb between the four cardinal points, making an oblique angle with the meridian; in which case, the continually changes both latitude and longitude. See *Sailing*.

OBLIQUE SPHERE, where the pole is elevated any number of degrees less than 90°; in which case, the axis of the world, the equator, and parallels of declination will cut the horizon obliquely.

OBLIQUITY of the *Ecliptic*. See *Ecliptic*.

OBLONG, a figure that is longer than broad: such is a parallelogram, ellipsis, &c.

O B S

OBSEQUIES, the same with funeral solemnities.

OBSERVATION, among navigators, signifies the taking the sun's, or a star's meridian altitude, in order thereby to find the latitude.

OBSERVATORY, a place destined for observing the heavenly bodies; being generally a building erected on some eminence, covered with a terrace for making astronomical observations.

OBSTRUCTION, in medicine, such an obturation of the vessels, as prevents the circulation of the fluids, whether of the sound and vital, or of the morbid and peccant kind, through them, arising from an access of the bulk of the fluid to be transmitted, above the capacity of the vessel which ought to transmit it. Such an obstruction, then, proceeds either from the narrowness of the vessels, or the excessive bulk of the fluids to be transmitted through them, or a concurrence of both these circumstances. The narrowness of the vessels is produced either by external compression, the proper contraction of the vessels themselves, or an increased thickness in their membranes. The bulk of the molecules of the blood is increased by the viscidness of the fluids, or by means of an error loci. An obstruction may also proceed from a narrowness of the vessels in conjunction with the preternatural bulk of the molecules of the fluids.

When the different kinds of obstructions are distinctly known, it is no difficult matter to find a cure adapted to each. For that species of obstruction which arises from external compression, indicates the removal of the compressing cause, if possible. That species of obstruction which arises from an increased contraction of the fibres may be removed, first, by such medicines as correct the too great contraction of the fibres, vessels, and viscera; secondly, and more especially, if their virtues have immediate access to the part affected, which advantage is principally to be obtained by fomentations, fumigations, baths, and ointments; thirdly, by such remedies as empty the too full vessels composing the membranes. This intention is answered by evacuates, in general, but especially by laxative, diluting, resolvent, attenuating, deterfive, and evacuant medicines applied to the vessels themselves; and fourthly, by such medicines as resolve callosities when formed.

O B T U

OBTURATOR, in anatomy, a name for the two muscles of the thigh, one of which is the marfupialis, and is called obturator internus, and the other the obturator externus.

OBTUSE, blunt, dull, &c. in opposition to acute, sharp, &c. thus we say, obtuse angle, obtuse triangle, &c.

OCCIPITAL, in anatomy, a term applied to the parts of the occiput.

OCCIPITALES, or the **OCCIPITAL MUSCLES**, arise on each side from the os occipitis, where it adheres to the temporal bones.

OCCIPITIS OS, the **OCCIPITAL BONE**, in anatomy, the fourth bone of the cranium, so called from its situation in the occiput, or back part of the skull.

OCCIPUT, in anatomy, the hinder part of the head, or skull.

OCCULT, something secret, hidden, or invisible. The occult sciences are magic, necromancy, cabbala, &c.

OCCULT, in geometry, is used for a line that is scarce perceivable, drawn with the point of the compasses, or a leaden pencil. These lines are used in several operations, as the raising of plans, designs of building, pieces of perspective, &c. They are to be effaced when the work is finished.

OCCULTATION, in astronomy, the time a star or planet is hid from our sight, by the interposition of the body of the moon, or of some other planet.

Circle of Perpetual OCCULTATION, a parallel in an oblique sphere, as far distant from the depressed pole, as the elevated pole is from the horizon. All the stars between this parallel and the depressed pole never rise, but lie constantly hid under the horizon of the place.

OCCUPANT, in law, the person that first seizes or gets possession of a thing; and this by law must be of what has a natural existence, as of land, &c.

OCCUPATION, in a legal sense, use or tenure, as in deeds it is frequently said, that such lands are or lately were in the tenure or occupation of such a person. This is likewise used for a trade, or mystery.

OCCUPATION, or **OCCUPANCY**, in the civil law, the possession of such things as at present properly belong to no private person, but are capable of being made so, as by seizing or taking of spoils in war, by catching things wild by nature, as birds and beasts of game, &c.

or by finding things before undiscovered, or lost by their proper owners.

OCEAN, in geography, that vast collection of salt and navigable waters in which the two continents, the first including Europe, Asia, and Africa, and the last America, are inclosed like islands. The ocean is distinguished into three grand divisions. 1. The Atlantic ocean, which divides Europe and Africa from America, which is generally about three thousand miles wide. 2. The Pacific Ocean, or South Sea, which divides America from Asia, and is generally about ten thousand miles over. And, 3. The Indian Ocean, which separates the East Indies from Africa, which is three thousand miles over. The other seas, which are called oceans, are only parts or branches of these, and usually receive their names from the countries they border upon.

* **OCEANUS**, in pagan mythology, the son of Caelus and Terra, the husband of Thetis, and the father of the rivers and fountains. The ancients called him the father of all things, imagining he was produced by humidity, which, according to Thales, was the first principle from which every thing was produced. Homer represents Juno visiting him at the remotest limits of the earth, and acknowledging him and Thetis as the parents of the gods. He was represented with a bull's head, as an emblem of the rage and bellowing of the ocean, when agitated by a storm.

OCHRE, *Ochra*, in natural history, a genus of earths slightly coherent, and composed of fine, smooth, soft, argillaceous particles, rough to the touch, and readily diffusible in water. Ochres are of various colours, as red, yellow, blue, brown, green, &c. Of the red there are eleven species, of the yellow as many, of blue one, of brown two, of green one, and of black two. All which have, at one time or other, been used in painting, and three of them are now used in medicine.

OCIMUM, or **OCHYMUM**, basil, in botany, a genus of plants. Both the herb and seeds of basil are used in medicine, and are said to be good in disorders of the lungs, and to promote the menses.

OCTAGON, or **OCTOGON**, in geometry, a figure of eight sides and angles; and this, when all the sides and angles are equal, is called a regular octagon, or one which may be inscribed in a circle. If the radius of a circle circumscribed

circumscribing a regular octagon be r , and the side of the octagon $= y$; then $y = \sqrt{2r^2 - r\sqrt{2r^2}}$.

OCTAGON, in fortification, a place that has eight bastions.

OCTAHEDRON, or **OCTAEDRON**, in geometry. one of the five regular bodies, consisting of eight equal and equilateral triangles. The square of the side of the octahedron is to the square of the diameter of the circumscribing sphere, as 1 to 2. If the diameter of the sphere be 2, the solidity of the octahedron inscribed in it will be 1,33333, nearly. The octahedron is two pyramids put together at their bases, therefore its solidity may be found by multiplying the quadrangular base of either of them, by one third of the perpendicular height of one of them, and then doubling the product.

OCTANDRIA, in botany, one of the classes of plants established by Linnæus, the eighth in order; the characters of which are, that all the plants comprehended in it have hermaphrodite flowers, and eight stamina or male parts in each. It is sub-divided into orders, which are denominated from the number of pistils contained in each flower: thus the octandria-monogynia contain eight stamina, and only one pistil; the octandria-digynia, eight stamina, and two pistils; and so on, trigynia, tetragynia, &c. denoting three, four, &c. pistils.

OCTAVE, in music, an harmonical interval, consisting of seven degrees, or lesser intervals. The most simple perception that we can have of two sounds, is that of unisons; as the vibrations there begin and end together. The next to this is the octave, where the more acute sound makes precisely two vibrations, while the grave or deeper one makes one; and wherein, by consequence, the vibrations of the two meet at every vibration of the more grave one. Hence unison and octave pass almost for the same concord: hence also the proportion of the two sounds that form the octave are in numbers or in lines, as 1 : 2; so that two chords or strings of the same matter, thickness, and tension, one whereof is double the length of the other, produce the octave.

OCTAVE, in law, the eighth day inclusive after any feast.

OCTOBER, in chronology, the tenth month of the Julian year, consisting of thirty-one days: it obtained the name of October from its being the eighth month in the calendar of Romulus.

OCULUS BELI, in natural history, one of the semi-pellucid gems, of a grayish white colour, variegated with yellow, and with a black central nucleus: it is of a roundish form, and its variegations very beautifully represent the pupil and iris of the eye; whence the name.

OCULUS MUNDI, one of the semi-pellucid gems, of a whitish grey colour, without any variegations.

ODA-BACHI, or **ODDOBASSI**, among the Turks, an officer equivalent to a serjeant or corporal among us. The common soldiers and janizaries, called oldachis, after having served a certain term of years, are always preferred, and made biquelars; and from being biquelars, they in time become oda-bachis; that is, corporals of companies, whose numbers are not fixed, being sometimes ten, and sometimes twenty. Their pay is six doubles per month, and they are distinguished by a large felt a foot broad, with two large ostrich feathers.

ODE, in poetry, a song, or composition proper to be sung. Among the ancients, odes signified no more than songs; but with us they are very different things. The ancient odes were generally composed in honour of their gods, as many of those of Pindar and Horace. These originally had but one stanza, or strophe, but afterwards they were divided into three parts, the strophe, the antistrophe, and the epode. The priests going round the altar singing the praises of the gods, called the first entrance, when they turned to the left, the strophe; the second, turning to the right, they called antistrophe, or returning; and lastly, standing before the altar, they sung the remainder, which they called the epode. Heroes and triumphs were also subjects for the ode; and in course of time love and entertainments were likewise thought very suitable to it. Here Anacreon and Sappho excelled, and Horace has left us some of both sorts wrote with peculiar sweetness and elegance. Among the moderns, Dryden's ode on St. Cecilia's day, and Pope's on the same subject, are justly allowed to exceed every thing of the kind, either in this, or any of the modern languages. The distinguishing character of an ode is sweetness; the poet is to smooth the minds of his readers by the variety of his verse, and the delicacy of words; the beauty of numbers, and the liveliness of expressions: for variety of numbers is essential to the ode. At first, indeed, the verse of the ode was but of one kind, but for

for the sake of pleasure, and to adapt it to music, the poets so varied the numbers and feet, that their kinds are now almost innumerable. One of the most considerable is the Pindaric, distinguished by its boldness, and the rapidity of its flights. An ode may either be sublime or of the lower strain, jocular or serious, mournful or exulting, even sometimes satirical, but never epigrammatical; and, in short, it may consist of wit, but not of that turn which is the peculiar characteristic of an epigram.

ODOROUS, or **ODORIFEROUS**, whatever smells strongly, whether they be fetid or agreeable; but chiefly applied to things whose smell is brisk, and agreeable.

ODYSSEE, *Ὀδυσσεύς*, a celebrated epic poem of Homer, wherein are related the adventures of Ulysses, in his return from the siege of Troy.

The moral of the odyssey is, that a person's absence from home, so that he cannot have an eye to his affairs, occasions great disorders; and, accordingly the hero's absence is the principal and most essential action of the whole poem. This poem, adds Bossu, is better calculated for the people than the Iliad, where the subjects suffer rather from the bad conduct of their princes, than by their own faults; whereas the meanest people are as liable to ruin their estates and families by negligence, as the greatest princes; and consequently, have as much need of Homer's lectures, and are as capable of profiting by them as kings themselves.

OECONOMICS, the art of managing the affairs of a family, or community; and hence the person who takes care of the revenues and other affairs of churches, monasteries, and the like, is termed *oeconomus*.

OECONOMY, *οικονομία*, denotes the prudent conduct, or discreet and frugal management, whether of a man's own estate, or that of another.

Animal **OECONOMY**, the first branch of the theory of medicine; or that which explains the parts of the human body, their structure and use, the nature and cause of life and health, and the effects, or phenomena arising from them.

OEUMENICAL, general or universal. As an oecumenical council, or synod; that is, one at which the whole Christian church assisted.

OEDEMA, or **PHLEGMATIC TUMOUR**, in medicine and surgery, a sort

of tumour attended with paleness and cold, yielding little resistance, retaining the print of the finger when pressed with it, and accompanied with little or no pain. See *Tumour*.

This tumour obtains no certain situation in any particular part of the body, since the head, eye-lids, hands, sometimes part, sometimes the whole body, is afflicted with it. When the last mentioned is the case, the patient is said to be troubled with a cachexy, leucophlegmatia, or dropsy.

But if any part of the body is more subject to this disorder than another, it is certainly the feet, which are at that time called swelled or oedematous feet.

The method of treating oedematous tumours is very different, according to the different causes to which they owe their origin: therefore we are first to make diligent search after the genuine cause of the disorder, before we attempt its cure. The external method of treating these tumours in the legs and feet, is usually to have recourse to frequent frictions with warm cloaths, to be repeated evening and morning till the parts grow red and hot; then the limbs are to be diligently preserved from the injuries of the cold air, by wearing stockings made of some warm fur, and at night keeping hot bricks about the legs and feet. After this there is a proper bandage to be applied, which is to ascend gradually from the feet up to the knees. The first step towards a cure by internal-medicines, according to Junker, must be the correcting the mucous and viscid state of the humours by the neutral salts, as tartarum vitriolatum, and the like; and by gum ammoniacum, the roots of pimpinell, and woods of sassafras, guaiacum, and the like; with the warm aromatics, as ginger and the spices, and carminative seeds; the matter when thus attenuated is to be evacuated by purges of a strength proportioned to the constitution of the patients. After the use of these internal and external medicines just before-mentioned, Heister thinks it proper to use strengthening remedies externally; for which end the limb is to be placed over burning rectified spirits of wine, wrapping it up in cloaths, in such a manner as it may receive the steam. This will incline the stagnating fluids to escape through the skin, or render them fit to return into the circulation, and at the same time restore the natural tone of the limb.

* **OEDIPUS**, in fabulous history, the

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son of Laius king of Thebes, and Jocasta. He was given by his father to a shepherd, with directions to put him to death, to prevent the misfortunes with which he was threatened by an oracle. But the shepherd, unwilling to spill his blood, tied him by the feet to a tree, that he might be devoured by wild beasts. The infant was found in this situation by another shepherd, named Phorbas, who carried him to Polybus, king of Corinth; where the queen, having no children, educated him as if he had been her son. When he was grown up, he was informed that he was not the son of Polybus, on which, by order of the oracle; he went to seek for his father in Phocis; but scarce was he arrived in that country, when he met his father on the road, and killed him without knowing him. A short time after, having delivered the country from the monster called the Sphinx, he married Jocasta, without knowing that she was his mother, and had four children by her; but afterwards being informed of his incest, he quitted the throne, and thinking himself unworthy of the light, put out his eyes.

OENANTHE, water-dropwort, in botany. A species of this plant, called the hemlock dropwort, with all the leaves multifid and obtuse, is a terrible poison.

OENOTHERA, the PRIMROSE of VIRGINIA, in botany.

OESOPHAGUS, in anatomy, the gula, or gullet, is a membranaceous canal, reaching from the fauces to the stomach, and conveying into it the food taken in at the mouth. Its figure is somewhat like that of a funnel, and its upper part is called by anatomists the pharynx.

OFFICE, a particular charge or trust, or a dignity attended with a public function.

OFFICE, a place or apartment appointment for officers to attend in order to discharge their respective duties.

OFFICE, in architecture, in the plural denotes all the apartments appointed for the necessary occasions of a palace or great house, as kitchens, pantries, confectionaries, &c.

OFFICE, in the canon-law, a benefice that has no jurisdiction annexed to it.

OFFICER, a person possessed of a post or office.

Commission-OFFICERS, those which are appointed by the king's commission: such are all from the general to the cornet.

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inclusive, who are thus denominated in contradistinction to warrant-officers, who are appointed by the colonel's or captain's warrant, as quarter masters, serjeants, corporals, and even chaplains and surgeons.

Field-OFFICERS, such as command a whole regiment, as the colonel, lieutenant colonel, and major.

Flag-OFFICERS. See *Flag-Officers* and *Admirals*.

General-OFFICERS, those whose command is not limited to a single company, troop, or regiment; but extends to a body of forces, composed of several regiments: such are the general, lieutenant-general, major-generals, and brigadiers.

OFFICERS of Police, those in whom the government and direction of the affairs of a community are invested, as mayors, aldermen, sheriffs, justices of the peace, &c.

Royal-OFFICERS are those who administer justice in the king's name, as the judges, &c.

Sea-OFFICERS, or **OFFICERS of the Marine**, those who command ships of war.

Staff-OFFICERS, such as, in the king's presence, bear a white staff, or wand; and at other times, on their going abroad, have it carried before them by a footman bare-headed: such are the lord steward, lord chamberlain, lord treasurer, &c. The white staff is taken for a commission, and at the king's death each of these officers breaks his staff over the hearse made for the king's body, and by this means lays down his commission, and discharges all his inferior officers.

Subaltern-OFFICERS, those who administer justice in the name of subjects; as those who act under the earl marshal, admiral, &c. In the army, the subaltern officers are all those under the degree of a captain.

OFFICIAL, in the canon law, an ecclesiastical judge, appointed by a bishop, chapter, abbot, &c. with charge of the spiritual jurisdiction of the diocese. Of these there are two kinds: the one is, as it were, the vicar-general of the diocese, and is called by the canonists *officialis principalis*, and in our statute law, the bishop's chancellor. There is no appeal from his court to the bishop, his being esteemed the bishop's court.

OFFICIAL, a deputy appointed by an archdeacon, as his assistant, who sits as judge in the archdeacon's court.

OFFICIAL, in pharmacy, an appellation

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pellation given to such medicines, whether simple or compound, as are required to be constantly kept in the apothecaries shops.

OFF-SETS, in gardening, the young shoots that spring from the roots of plants; which, being carefully separated, and planted in a proper soil, serve to propagate the species.

OFF-SETS, in surveying, perpendiculars let fall, and measuring from the stationary lines to the hedge, fence, or extremity of an enclosure.

OGEE, or O. G. in architecture, a moulding, consisting of two members, the one concave, and the other convex; or, of a round and a hollow, like an S.

OIL, *Oleum*, in natural history, an unctuous inflammable matter drawn from several natural bodies, as animal and vegetable substances. The chymists call it sulphur, being the second of their hypostatical, and of the true five chemical principles. To this they attribute all the diversity of colours, and all the beauty and deformity of bodies: probably their various odours in a great measure arise from it. It sweetens the acrimony of salts; and by stopping, or filling up the pores of a mixed body, keeps it longer from corruption, where it abounds. And we find that the evergreens, such as box, holly, &c. abound more with oil than other plants. There are two sorts of oils; one of which seems to be mixed with spirit, for it can never be drawn pure, and which will swim upon water; such as oil of anniseeds, lavender, rosemary, &c. which the chemists call essential, and is commonly drawn in an alembic, with plenty of water. And another kind, which probably is mixed with salts, and these will sink in water; such are the oils of ponderous woods, as guaiacum, box, cloves, &c. There are some things which are very improperly called oils; as oil of tartar per deliquium, which is only a fixed salt dissolved. Oil of vitriol, which is nothing but the most caustic and strongest part of the spirit of vitriol. Oil of antimony, which is only a mixture of antimony and an acid spirit. Oils are of two kinds, the one obtained by expression, and the other by distillation.

The method of procuring oil by expression from nuts, seeds, mast, &c.

Take two pounds of sweet almonds, blanched and beat small in a stone mortar; wrap the mass up in a piece of strong thick canvas, and commit it to a strong

screw press; when, being squeezed between two cold iron checks, it will gradually part with a considerable quantity of oil. This method holds of all these vegetable matters that contain a copious oil, in a loose manner, or in certain cavities or receptacles; the sides whereof being broke, or squeezed, makes them let go the oil they contain: and thus the zett or oil of lemon-peel, orange-peel, citron-peel, &c. may be readily obtained by pressure, without the use of fire. But how far this method of obtaining oils may be applied to advantage, seems not hitherto considered. It has been commonly applied to olives, almonds, linseed, rape-seed, beech-mast, ben-nuts, wal-nuts, bay-berries, mace, nutmeg, &c. but not that we know of to juniper-berries, Cashew-nuts, Indian cloves, pine-apples, and many other substances that might be enumerated, both of foreign and domestic growth. It has, however, been of late successfully applied to mustard-seed, so as to extract a curious gold-coloured oil, leaving a cake behind, fit for making the common table-mustard. Certain dry matters, as well as moist ones, may be made to afford oils by expression, by grinding them into a meal, which, being suspended to receive the vapour of boiling water, will thus be moistened so as to afford an oil, in the same manner as almonds; and thus an oil may be procured from linseed, hemp-seed, lettuce-seed, white poppy-seed, &c. As to the treatment of oils, obtained by expression, they should be suffered to depurate themselves by standing in a moderately cool place, to separate from their water, and deposit their faeces; from both which they ought to be carefully freed. And if they are not thus rendered sufficiently pure, they may be washed well with fresh water, then thoroughly separated from it again, by the separating-glass, whereby they will be rendered bright and clear. Particular care must be had to keep such of these oils cool as are designed for eating, or for any internal use; because they are apt in a few days to turn rancid and corrosive with the heat of the summer's sun, so as to prove very unwholesome. Hence the physician and apothecary should be curious that the oils given in pluries and other distempers be fresh drawn from sound subjects, no way tainted, or already turned rancid: as almonds, pistachios, and other nuts are apt to do: and again, that these oils have felt no considerable heat, either by drawing

ing or standing long in a warm place : and the same caution should likewise extend to animal oils, intended both for internal and external use ; since these are to become rancid, or change to a yellow, red, or grey colour in hot weather ; and thus become exceedingly nausious and corrosive, as we see in butter, bacon, and other fat-bodies ; which then prove only fit for the tallow-chandler, or other ignoble uses.

The method of procuring essential oil is in the following manner.

Take eight pounds of juniper-berries, bruise them in a stone mortar, put them into a still, along with four gallons of river water ; and, working with a brisk fire, draw off a gallon of water, with it will be obtained a considerable proportion of a fragrant essential oil, which must be separated from the water by a separating glass.

This process is applicable to the distilling of the essential oils from flowers, leaves, barks, roots, woods, gums, and balsams, with a slight alteration of circumstances, as by longer digestion, brisker distillation, &c according to the tenacity and hardness of the subject, the ponderosity of the oil, &c.

Essential oils may be divided into two classes, according to their different specific gravities ; some floating upon water, and others readily sinking to the bottom. Thus, the essential oils of cloves, cinnamon, and saffras, readily sink ; whereas those of lavender, marjorum, mint, &c. swim in water : the lightest of these essential oils, is, perhaps, that of citron-pee, which even floats in spirit of wine ; and the heaviest seems to be the oil of saffras. See *Gravity*.

For obtaining the full quantity of the more ponderous oils from cinnamon, cloves, saffras, &c. it is proper to reduce the subjects to powder ; to digest this powder for some days in a warm place, with thrice its quantity of soft river water, made very saline by the addition of sea-salt, or sharp with oil of vitriol ; to use the strained decoction, or the liquor left behind in the still, instead of the common water, for fresh digestion ; to use for the same purpose the water of the second running, after being cleared of the oil ; not to distil too large a quantity of these subjects at once ; to leave a considerable part of the still, or about one fourth empty ; to use a brisk fire, or a strong boiling heat, at the first, but to

slacken it afterwards ; to have a low still-head, with a proper internal ledge and current leading to the nose of the worm ; and, finally, to cohobate the water, or pour back the liquor of the second running upon the matter in the still, repeating this once or twice.

Many of the essential oils being dear, it is a very common practice to adulterate or debase them several ways, so as to render them cheaper both to the seller and the buyer. These several ways seem reducible to three general kinds, each of which has its proper method of detection, viz. 1. With expressed oils. 2. With alcohol. And, 3. With cheaper essential oils.

If an essential oil be adulterated with an expressed oil, it is easy to discover the fraud, by adding a little spirit of wine to a few drops of the suspected essential oil, and shaking them together ; for the spirit will dissolve all the oil that is essential, or procured by distillation, and leave all the expressed oil that was mixed with it, untouched.

If an essential oil be adulterated with alcohol, or rectified spirit of wine, it may be done in any proportion, up to that of an equal quantity, without being easily discoverable, either by the smell or taste : the way to discover this fraud, is to drop a few drops of the oil into a glass of fair water : and if the oil be adulterated with spirit, the water will immediately turn milky, and by continuing to shake the glass, the whole quantity of spirit will be absorbed by the water, and leave the oil pure at top.

Finally, if an essential oil be adulterated by a cheaper essential oil, this is commonly done very artfully : the method is to put fir-wood, turpentine, or oil of turpentine into the still, along with the herbs to be distilled for their oil, such as rosemary, lavender, origanum, &c. and, by this means, the oil of turpentine distilled from these ingredients comes over in great quantity, and intimately blended with the oil of the genuine ingredient. The oils thus adulterated always discover themselves in time, by their own flavour being overpowered by the turpentine-smell ; but the ready way to detect the fraud is to drench a piece of rag, or paper, in the oil, and hold it before the fire ; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine scent behind.

The virtues of oils being the same with those of the substances from whence they

are obtained, may be learned under their several articles.

Oil is well known to stop the violent ebullition of various substances: thus, if sugar, honey, &c. be boiling, and in danger of rising over the sides of the vessel, the pouring in a little oil makes it immediately subside.

OIL-MILL, one that serves to bruise or break the nuts, olives, and other fruits and grains, whose juice is to be drawn by expression, to make oil.

There are two different methods of expressing oils; one chiefly used in extracting oil from olives, &c. by means of a very strong press.

The other, which is commonly called an oil-mill, is chiefly used for expressing oils from seeds, &c. We have given a perspective view of one, plate xxxvii. where A is a large wheel turned either by water or horses, the cogs of which work in the trundle-head B, and give motion to the large shaft H K. N, N, N, N, are lifting cogs, which raise the stampers O P, O P, &c. Q, Q, are larger lifting cogs, being intended to raise the stampers R R, S S, &c. to a much greater height than the former. T V, c d, are battens for guiding the stampers in their motion; and a, b, battens to which the catches are fixed for suspending the stampers. The seeds are ground either in the mill represented in fig. 2, or pounded in the mortars f, f, f, f. When the seeds are thus thoroughly bruised, the mash is taken out, and put into small bags of hair lined with thin canvas. The bags thus filled are placed in the press at 1, 5, and the oil extracted by the force of wedges driven by the stampers S, S. 6, 4, 4, 7, are pieces of wood for filling up the vacuities when the bags are placed in the press. 3 is the wedge driven by the stamper S S, which forces the bags filled with the bruised seed into a less compass, and consequently extracts the oil. When the seeds are sufficiently pressed, the stamper R R is raised, and by falling on the inverted wedge 2, the whole pressure is removed, and the bags, together with the wedge 3, easily taken out of the press. X Y represents the outside of the press and mortars; and Z Æ, a section of both.

Fig. 2, is a mill for grinding the seeds. It consists of two large stones moving on their edges in a circular bed. The mill is put in motion by means of the cog-wheel G, whose cogs play in the rounds

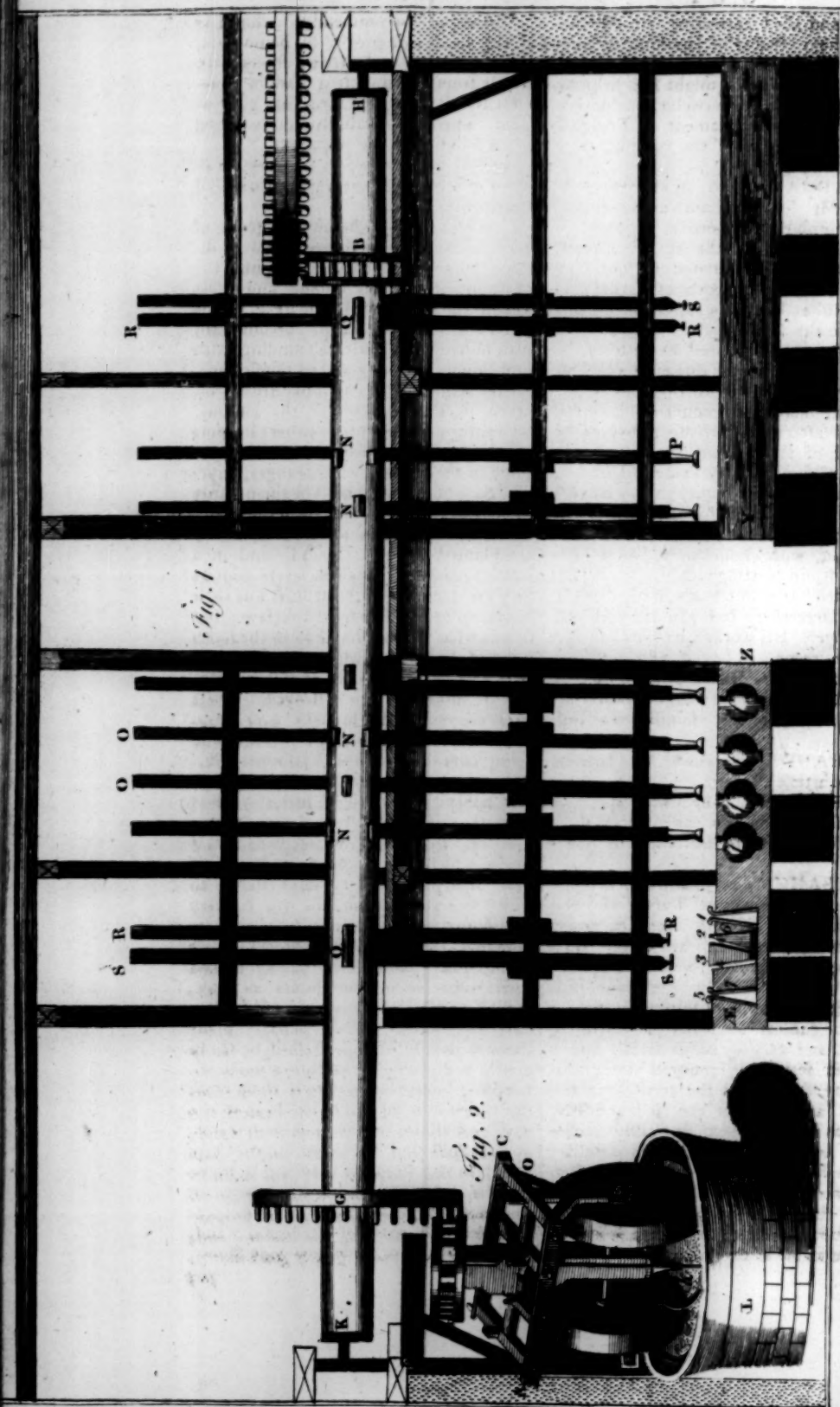
of the lantern D. A B C D is a frame of wood for turning the stones m, b. e k f is a kind of hook for stirring the seeds while the stones revolve round their axis. The basis L of the mill-bed is hollow, for receiving the oil pressed out of the seeds in grinding.

OINTMENT, or **UNGUENT**, in pharmacy and surgery. See *Unguent*.

* **OLDCASTE**, Sir John, lord Cobham, the first author, and the first martyr, among our nobility, a man whose virtues made him a reformer, whose valour a martyr, and whose martyrdom an enthusiast. The amiableness of his character procured him the general appellation of the good lord Cobham. He married the niece and heiress of the lord Cobham, and, upon his marriage, assumed that title. He was much esteemed by king Henry V. and served with great zeal at a time when the church was lighting its holy fires for the disciples of Wickliffe. The great increase of that sect greatly alarmed the government, especially as lord Cobham was at the head of it. Henry, at first, resisted the insinuations thrown out against him, whom he tried to save by gentle exhortations; but as the peer was firm, it naturally made the prince weak, and he delivered the hero over to the inquisitors. Lord Cobham was in prison, but escaped.

The clergy, however, with great zeal for the royal person, informed the king, who was then at Eltham, that 20,000 Lollards were assembled at St. Giles's, for the destruction of him and his brothers. The brave young monarch immediately headed a troop, and arriving at ten at night, at the sign of the axe, without Bishopgate, took the man of the house and seven others prisoners. Four-score more were seized about St. Giles's, and some of them being induced, it is said, to confess the design of murdering the royal family, and make the lord Cobham protector, the king no longer doubted of the conspiracy, but ordered about half of them to be executed, and issued a proclamation for apprehending Cobham, who was concealed in Wales. Lord Cobham was soon after taken by the lord Powis, after a brave resistance, in which he was wounded. The proclamation for apprehending him, offered a thousand marks of gold, twenty pounds a year for life, and a discharge from all taxes to any city, borough, or town that should deliver him up. He was burnt at St. Giles's in the Fields, in February,





1418, and died entreating Sir Thomas Erpingham, that if he saw him rise from death to life the third day, he would procure that his sect might live in peace and quiet. He wrote twelve conceptions, addressed to the parliament of England, and a piece, entitled the complaints of the countryman.

* **OLDHAM**, John, an eminent poet, son of Mr. John Oldham, a non-conformist minister, was born at Shipton, in Gloucestershire, on the 9th of August, 1653. He was educated at Oxford, and in 1674 took the degree of bachelor of arts. In a short time after, he became usher to the free-school of Croydon, in Surry, where he received a visit from the earl of Rochester, the earl of Dorset, Sir Charles Sedley, and other persons of distinction, merely on account of his verses. He was afterwards private tutor to the children of several gentlemen, and having saved some money came to London, where he became a votary to the bottle: he contracted a strict friendship with Mr. Dryden; and was caressed by the earl of Kingston, with whom he lived at Holme-Pierpont, in Nottinghamshire, where being seized by the small-pox, he died on the 9th of December, 1683, in the 30th year of his age. His works are printed in two volumes 12mo. They chiefly consist of satires, odes, translations, paraphrase of Horace, and other authors, elegiac verses, imitations, parodies, familiar epistles, &c.

OLEANDER, *nerium*, in botany. See the article *Nerium*.

OLFACTORY NERVES, the first pair of the head; so called from their being the immediate instrument of smelling.

OLIBANUM, in pharmacy, a gummy resin brought from Turkey and the East-Indies, usually in drops or tears, like those of mastich, but larger, of a pale yellowish colour, which by age becomes reddish. Of the tree which produces it we have no certain account.

This gummy resin has a moderately strong, not very agreeable smell, and a bitterish somewhat pungent taste: in chewing, it sticks to the teeth, becomes white, and renders the saliva milky. Laid on a red-hot iron, it readily catches flame, and burns with a strong, diffusive, not unpleasant smell: it is supposed to have been the incense used by the ancients in their religious ceremonies, though it is not the substance now known by that name in the shops,

Olibanum is recommended in disorders of the head and breast, in hemoptoes, and the alvine and uterine fluxes: the dose is from a scruple to a dram or more.

OLIGARCHY, a form of government, where the administration is lodged in the hands of a few people.

OLIO, or **OGLIO**, in cookery, a savoury dish composed of a great variety of ingredients.

OLIVE, *Olea*, in botany, a genus of trees, with a monopetalous flower, divided into four segments at the limb; the leaves are in general oblong and evergreen: the ovary, which is fixed to the center of the flower-cup, becomes an oval, soft, pulpy fruit, abounding with a fat liquor, inclosing a hard rough stone. There are five sorts of olive-trees preserved in the gardens of the curious, where they are planted either in pots or cases, and removed into the greenhouse in the winter, with oranges, myrtles, &c. but they are most of them hardy enough to endure the cold of our ordinary winters in the open air, provided they are planted upon a dry soil, and in a warm situation, though in severe winters they are demolished, or at least lose their heads, or are killed to the surface; but this is what they are liable to in the south parts of France, in which country these trees abound; and yet in very sharp winters are most of them destroyed. These trees are generally brought over from Italy every spring, by the persons who bring over the oranges, jasmines, &c. from whom they may be procured pretty reasonably; which is a better method than to raise them from layers in this country, that being too tedious; and those which are thus brought over, have many times very large stems, to which size young plants in this country would not arrive in ten or twelve years growth. When you first procure these stems, you should, after having soaked their roots twenty-four hours in water, and cleaned them from the filth they have contracted in their passage, plant them in pots filled with fresh light sandy earth, and plunge them into a moderate hot-bed; observing to screen them from the violence of the sun in the heat of the day, and also to refresh them with water, as you shall find the earth in the pots dry. In this situation they will begin to shoot in a month or six weeks after, when you should let them have air in proportion to the warmth of the season; and, after they have made pretty good shoots,

you

you should inure them to the open air by degrees; into which they should be removed, placing them in a situation where they may be defended from strong winds: in this place they should remain till October following, when they must be removed into the green house, as was before directed. Having thus managed these plants until they have acquired strong roots, and made tolerable good heads, you may draw them out of the pots, preserving the earth to their roots, and plant them in the open air in a warm situation, where you must manage them as was before directed for the young ones, and these will in two or three years produce fruit, provided they do well. The Lucca and box-leaved olives are the hardiest, for which reason they should be preferred to plant in the open air; but the first sort will grow to be the largest trees. Olives are very oily and smooth, and therefore not good for the stomach, being apt to pall and relax it too much. The oil of olives is judiciously mixed with cataplasms of a maturating nature: it is accounted heating, emollient, and vulnerary; and good against costiveness and gripes.

OLYMPIAD, in chronology, the space of four years; so called from the Olympic games, instituted by Hercules, anno mundi 1836, which were celebrated every four years, about the time of the summer solstice, upon the banks of the river Alphæus, near the city Pisa, and the temple of Jupiter Olympius, in Elis, a province in Peloponnesus. These games were restored by Iphitus, four hundred and forty-two years after the first institution by Hercules, and twenty-two or twenty-three years before the foundation of Rome. The Greek historians began a new epocha, the first year of the first Olympiad. We are to observe that, to speak exactly, every Olympiad year belongs to two Julian years; that is to say, the first six months from July to January, to the foregoing; and the six last months from January to July, to the following year; though most authors speak of the Olympiads as if they had begun the first of January, as for example, it is the same thing to say, such a thing was done in the first year of the sixth Olympiad, as to say, it was done in that Julian year in which the sixth Olympiad began; these were every fifth year, or, as the interpreter of Lycophron says, every fiftieth month.

The design of the institution was to ac-

custom young men to running, leaping, and other exercises. They held but five days. The conqueror was called Olympionices, and to be crowned there, was as glorious as to triumph at Rome; for the Olympionices was attended home in his coach, the wall of the city broken down, and he drove in at the breach. These were called Olympia magna, to distinguish them from other plays of this nature that were instituted at Macedonia, at Athens, &c. Choræbus was the first who was crowned at these games for having obtained the victory by running. The number of Olympic years to the birth of Christ is 76, and the years of Rome before that time but 753, because the first Olympiad of the chronologers began 23 years before the foundation of Rome.

* **OLYMPIC GAMES**, in Grecian antiquity. They were instituted by Hercules, the son of Alcmena, in honour of the Olympian Jupiter, out of the spoils taken from Auges king of Elis, whom he had dethroned and plundered, for defrauding him of the reward he had promised him for cleansing his stable; however, they were either wholly laid aside, or but little frequented, till the time of Iphitus, who re-instituted this solemnity about 480 years after the Trojan war, from which time the number of Olympiads are reckoned. These games were celebrated every fifth year, and always lasted five days. The common exercises were leaping, running, throwing darts, and wrestling; musicians, poets, and artists, also contended for the victory by the excellence of their performances. Such as obtained the victory in any of these, was crowned with an olivegarland, conducted home in a triumphal chariot, and a breach was made in the city-wall to give him entrance. At some places the victors had presents made them by their native city, were honoured with the first places at all shows and games, and ever after maintained at the public expence.

OMELET, or **AMELET**, a kind of pancake or fricasse of eggs, with other ingredients, very usual in Spain and France.

OMEN, a sign, or indication of some future event, taken from the mouth of the person speaking.

OMENTUM, in anatomy, the cawl, also called reticulum, from its structure resembling that of a net. When the peritonæum is cut, as is usual, and the cavity

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cavity of the abdomen laid open, the omentum or cawl presents itself first to view. This membrane, which is like a wide and empty bag, covers the greatest part of the guts. Its mouth is tied on the right side to the hollow of the liver, on the left to the spleen, backwards to the back-part of the duodenum, and that part of the colon which lies under the stomach, and forwards to the bottom of the stomach and pylorus. Its bottom is loose, and being tied to no part, but floating upon the surface of the guts below the navel, was the reason why the cawl was by the Greeks called *σπινθηρ*. Sometimes it descends as low as the os pubis, within the productions of the peritonæum, causing an epiplocele.

ONANIA, or ONANISM, terms framed by some late empiricks, to denote the crime of self-pollution, mentioned in Scripture to have been practised by Onan, and punished in him with death.

ONDEE, in heraldry, the same with wavy. See *Wavy*.

ONION, *Cepa*, in botany, the name of a genus of plants. Onions are much eaten, and it would be well if they were yet more so; they attenuate tough humours, cleanse the stomach, and excite appetite, and in some degree promote the menses; but they are apt to breed flatulencies, and, if eaten too largely, to affect the head and disturb the sleep afterwards. An onion, boiled to perfect softness, is recommended by many as a cataplasm for ripening pestilential buboes. A fresh cut onion, rubbed on the part till it becomes red and itch, is said to be a cure for baldness. A mixture of equal parts of juice of onions and spirits of wine is esteemed a cure for deafness, a few drops being put at times into the ears: an onion cut in two, and macerated an hour in the same spirit, is a good application for the head-ach. A cataplasm of roasted onion and butter is an excellent application for the piles. The three sorts of onions propagated for the sake of their roots for winter use, are the Straburgh onion, the red Spanish onion, and the white. These are to be propagated by sowing their seeds in the latter end of February, in a dry and somewhat sandy soil, yet rich; in about a month's time the plants will appear, and, in a fortnight after that, they will be forward enough for hoeing, which must be done with a very small hoe, cutting up all the weeds, and leaving the onions two inches asunder; this should be done in a dry

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season, and the ground will then be clear from weeds for a month: at the end of this time, they must be hoed again, and cut to three inches apart; and a month after this, to four inches; at which distance they will thrive well, and grow very large. Toward the latter end of July, the onions will have arrived at their full growth, which is known by their leaves hanging down and shrivelling; and they must at this time be pulled up, and spread on a dry place, and turned every day, to prevent their striking fresh roots; in a fortnight's time they will be dry enough to house, and should be wiped clean, and spread thin in an upper loft, or garret. The differences between these species are not essential, they often degenerating into one another; and even the large Portugal onion, after a few years, with us, will lose itself so far, that no one would imagine it came of that race. *Miller's Gard. Dir.*

Welsh ONIONS, a sort of onions propagated by gardeners, for the use of the table in spring; they never make any bulb, and are therefore only to be eaten green with fallads. They are propagated by sowing their seeds towards the end of July in beds of a dry but rich soil; and, in three weeks after sowing, they will appear above ground: they must be kept carefully cleared from weeds. About October all their leaves die away, which has occasioned some to think all the plantation lost, and to dig up the ground for some other use; but, if they are suffered to stand, they will shoot up again very strong in January, and from that time will grow very vigorously, and resist all weathers, and will be fit to draw for young onions in March, and are extremely green and fine, and more valued at market at that season than any other kind; but they are much stronger than any other onions, and have nearly the taste of garlic.

ONOMATOPOEIA, in grammar and rhetoric, a figure where words are formed to resemble the sound made by the things signified; as the buz of bees, the cackling of hens, the whistling of the winds, &c.

ONTOLOGY, or ONTOSOPHY, the doctrine or science *de ente*; that is, of being, in the general, or abstract.

ONYX, in natural history, one of the semipellucid gems, with variously coloured zones, but none red; being composed of crystal, debased by a small admixture of earth; and made up either of a num-

a number of flat plates, or of a series of coats surrounding a central nucleus, and separated from each other by veins of a different colour, resembling zones or belts.

OOST, in husbandry, a name given by the people who manure hops, for the kiln in which they dry them after they are picked from the stalks.

OPACITY, in philosophy, a quality of bodies which renders them impervious to the rays of light. See *Light*.

The opacity and transparency of bodies in general are occasioned thus: let A B (plate XXXVI. fig. 2.) be the surface of an opaque body A B C D; a ray of light G H falling thereon in the point H, will in part be reflected into the ray H I, and by this reflected ray, the point H becomes visible to the eye at I; and thus all the points, and consequently the whole surface, is made visible by that part of the light which it reflects. But the other part of the ray entering into the body, being irregularly refracted and reflected through its internal substance of particles and pores, becomes divided, dissipated, absorbed, and lost therein; and therefore, as none of the rays can come from the internal parts to the eye, so none of those parts can be visible: and the body in that case is said to be opaque. In order to this we must consider, that though the whole body be opaque, yet the particles of such a body are not fully opaque, but freely transmit the light without reflecting any part between the surfaces, and are therefore in themselves transparent; and were these particles contiguous to each other, the light would pass from one to another, and so through the whole, without reflection; as we find by experiment it will pass through several contiguous pieces of polished glass, and thus produce transparency. But if the particles do not touch in such a manner as to leave the interstices or pores exceeding small, there will be a reflection of light at every pore from the air which it there meets with, as being a medium of different density. For it is known by experiment, that though a ray of light will pass from one piece of glass to another that is contiguous without reflection, yet will it not pass from the glass through the contiguous air without being in part reflected; consequently, where the pores are large and very numerous, there the reflection of light will be so great upon the whole as to cause a total dissipation and loss of the light that en-

tered the body, and so render it opaque.

This is confirmed by taking ten pieces of clear glass, and laying them one upon another over a leaf of print quite dry, and having only air between them; then taking ten other pieces of the same glass, and putting them into water, so that it may fill all their interstices; and then laying them on the same printed paper by the other, a person looking through each, will see the print, or reading, much more distinct, clear and bright, through the latter pieces than through the former, the rays being more regularly transmitted through them where the density of the parts is not so unequal, and also with much less reflection than through the other, where the light undergoes a considerable reflection at every interstice or place of air between the glasses.

It is hence also that transparent bodies are rendered opaque by separating their parts, and rendering them more porous: thus beer, before it is raised into froth, is transparent; but the froth, by reason of its pores, becomes opaque: thus dry paper is more opaque than that which is wetted with water or oil, because more porous: thus the oculus mundi stone is more opaque when dry than when steeped in water; and glass, reduced to powder, is no longer transparent. Hence it follows, that the parts of bodies, and their pores, must not be less than a certain definite bigness to render them opaque; for the opaquest bodies, if the parts be subtly divided, become perfectly transparent: thus copper, dissolved in aqua fortis, has all its particles pellucid; and the whole solution is transparent: thus a bubble blown off soap water, may become so thin on the top as to reflect no light, but will transmit the whole: thus water, salts, glass, stones, &c. though they are as porous as other bodies, yet their parts and interstices are too small to cause reflections in their common surfaces.

Therefore, in all transparent bodies, as B E F C, (fig. 3.) a ray of light, K L, falling on its surface, in the point L, will there be in that part reflected, as before into the ray L M; the other part will go regularly, or in a rectilinear direction from the upper to the lower surface at N, where meeting with the air, (a medium of a different density) it will be in part reflected again into the ray N O; the other part goes out to the eye at P; by which means all the internal parts from whence that ray comes, will be rendered visible to the eye: and since this

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Fig. 1.
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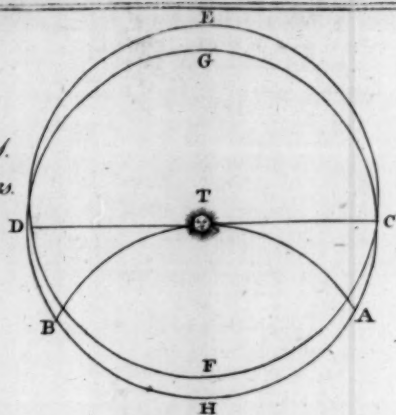
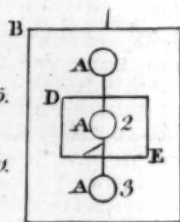


Fig. 3.

Optics.



K

Fig. 3

M

Opacity.

E

L

O

Opacity.

B

Fig. 2.

I

G

H

A

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C

D

Optics.

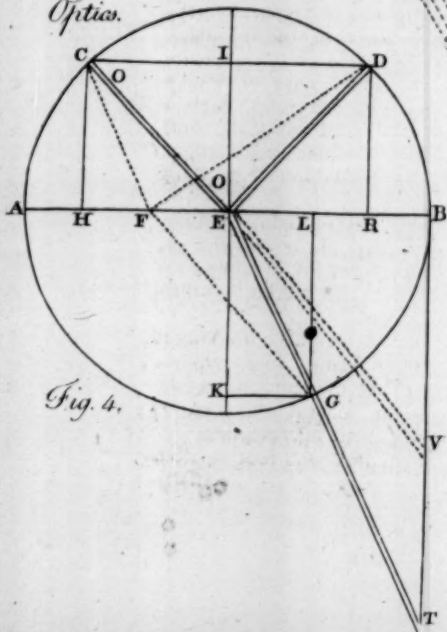


Fig. 4.

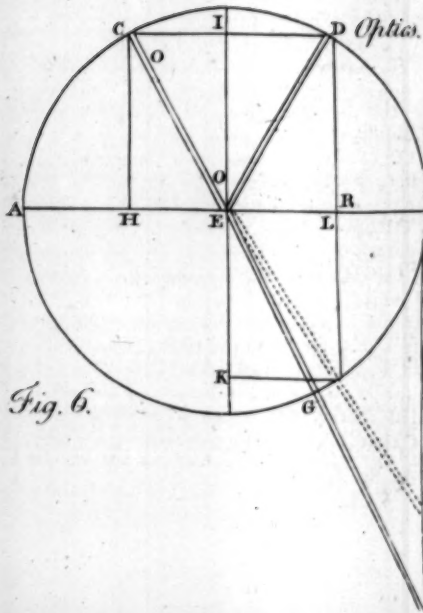


Fig. 6.

Optics.

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this may be conceived of every point in the body, it is easy to understand how the whole becomes transparent. See *Reflection and Refraction*.

OPAL, in natural history, a gem of a very peculiar kind. It is softer than any other of the fine gems, and is difficult to polish to any degree of nicety. It is found of various shapes and sizes; its most frequent bigness is between that of a pea and a horse-bean, but it is found as small as the head of a large pin, and has been seen of the size of a large walnut. Its figure is very various and uncertain, but it is never found in a crystalliform or columnar state; its most usual shape is an irregularly oblong one, convex above, flattened at bottom, and dented with various sinuosities at its sides. It is often found among the loose earth of mountains, sometimes on the shores of rivers, and not unfrequently bedded in the coarser kinds of Jasper. It is found in Egypt, Arabia, some parts of the East-Indies, and in many parts of Europe: those of Europe are principally from Bohemia, and are of a greenish or greyish colour; the colour of other opals much resembles the finest mother of pearl, its basis seeming a bluish or greyish white, but with a property of reflecting all the colours of the rainbow, as turned differently to the light.

OPENING of Trenches, the first breaking of ground by the besiegers, in order to carry on their approaches towards a place.

OPERA, a dramatic composition set to music, and sung on the stage, accompanied with musical instruments, and enriched with magnificent dresses, machines, and other decorations.

OPERATION, in general, the act of exerting or exercising some power or faculty, upon which an effect follows.

OPERATION, in chirurgery and medicine, a methodical action of the hand on the human body, in order to re-establish health.

OPERATION, in chemistry, the processes, or experiments, by means of which the proper changes are produced in bodies.

OPERATOR, one who performs an operation.

OPHITES, in natural history, a sort of variegated marble, of a dusky-green ground, sprinkled with spots of a lighter green, otherwise called serpentine.

OPHTHALMIA, in medicine, any disorder or pain in the eye; but it is used strictly to express an inflammation of that organ. An ophthalmia, says M. de St. Yves, is an inflammation of the

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conjunctiva, sometimes attended with violent heat and a flux of tears; sometimes without either heat or tears. This inflammation sometimes extends all over the globe of the eye, and even to the adjacent parts. Of all disorders of the eye, this is the most frequent, as it accompanies almost every disease to which the eye is subject. Some of these inflammations are without danger, and easily cured; others are very dangerous, and difficult to cure.

They are generally divided into the dry and humid.

The dry species of ophthalmia brings a redness on the eye without tears, or any purulent matter. It occasions no swelling of the eye-lid, nor pain in the eye, or in the head. It is caused by a thick blood, which stagnates only in some of the vessels of the conjunctiva, only part of the white of the eye being red.

The humid ophthalmia is produced by a great quantity of lachrymal lymph, which, as it passes continually over the globe of the eye, irritates the same by its acrimony, inflames it and the inner part of the eye-lids, which becomes swelled; it likewise often ulcerates the transparent part of the cornea. This disease is attended with shooting pains in the eye, and the patient cannot behold the light without intense pain. Children and old people are both subject to this disease, in whom it becomes very obstinate, by reason of the natural moisture of their temperament. When it runs to a length in children, their lips and noses swell, and are covered with scabs and pustules, that sometimes overspread the face.

For cure of the dry ophthalmia wash the inner part of the eye with collyrium, made of twelve grains of prepared tutty, dissolved in two ounces of rose and plantain waters, with the addition of a spoonful of spirit of wine. Take of Paul's betony, thyme, and red roses, each a handful; two stalks of mullein; boil them in a gallon of wine; and at night apply to the eye a compress dipped in this wine.

As this species of ophthalmia is not dangerous, it requires but few medicines, and is sometimes cured by bleeding, repeated according to the plethoric constitution of the patient.

The cure of the humid ophthalmia is sometimes very difficult, and requires more medicines than the last, besides such repetitions of the general remedies, as the state of the patient may require.

Bleeding at the neck and foot is often necessary.

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necessary. Apply a collyrium, made with the distilled waters of fennel, eye-bright, and plantain, of each two ounces, in which dissolve two grains of salt of lead. Sometimes a seton, a cautery, and blisters are obliged to be used. If the vesicatories incommode the kidneys or bladder, they must be laid aside, and other means employed. If the first collyrium, which is designed only as a sweetener, after some days, do not succeed, let another be substituted, which, by constringing the pores, will hinder the great afflux of tears to the eye; for which reason you may omit the salt of lead, and dissolve, in the same waters, half a dram of the white troches of rhais.

OPIATES, medicines prepared with opium.

OPINION, the assent of the mind to propositions not evidently true at first; nor deduced, by necessary consequences, from others that are so; but such as carry the appearance of truth.

OPIUM, in pharmacy, a concrete gummy-resinous juice; somewhat soft and tenacious, especially when much handled or warmed; of a dark reddish brown colour in the mass, and when reduced into powder yellow. It is brought from Egypt, Persia, and some other parts of Asia, in flat cakes or irregular masses, from four to about sixteen ounces in weight, covered with leaves to prevent their sticking together. It is extracted from the heads of white poppies, which in those countries are cultivated in the fields for this use. Kämpfer reports, that the heads, when almost ripe, are wounded with a five-edged instrument, by which as many parallel incisions are made at once from top to bottom; that the juice which exudes is next day scraped off, and the other sides of the heads wounded in like manner; and that the juice is afterwards worked with a little water, till it acquires the consistence, tenacity, and brightness of the finest pitch. The best opium was formerly called Thebaic opium, from its being prepared about Thebes in Egypt; no distinction is now made in regard to the places of its production, though the epithet Thebaic serves to distinguish some of its official preparations. Opium has a faint disagreeable smell, and a bitterish, hot, biting taste. Watery tinctures of it strike a black colour with chalybeate solutions, and thus seem to discover some astringency. Mixed with the serum of blood, they thicken and render it whitish;

and on blood itself, newly drawn, they have nearly a like effect. Mr. Eller observes, that on examining with a microscope, blood thickened by a vinous tincture of opium, the nature of its globules seemed to be destroyed. But neither from these, nor any of the other known sensible properties of this drug, can its surprising operation in the human body be deduced. Taken in proper doses, it commonly procures sleep, and a temporary respite from pain or the action of any stimulating power. The cause of the pain it in many cases confirms or augments; and in not a few, it is even of giving palliative relief. The cases in which it is proper or improper will be best understood from a view of its general effects; which, so far as experience

hitherto discovered them are following. It renders the solid operation of the opium continues, less sensible of every kind of irritation, whether proceeding from an internal cause, or from acrimonious medicines, as cantharides and the more active mercurials, of which it is the best corrector. It relaxes the nerves; abating or removing cramps or spasms, even those of the most violent kind; and increasing paralytic disorders and all debilities of the nervous system. It incrassates thin serous humours in the fauces and adjacent parts; by which means it proves frequently a speedy cure for simple catarrhs and tickling coughs; but in phthisical and peripneumonic cases, dangerously obstructs expectoration, unless this effect be provided against by suitable additions, as ammoniacum and squills. It produces a fullness and distension of the whole habit, and thus exasperates inflammations both internal and external, and all plethoric symptoms. It promotes perspiration and sweat; but restrains all other evacuations, unless when they proceed from relaxation and insensibility of the parts, as the colliquative diarrhoea in the advanced stage of hectic fevers. It promotes labour-pains and delivery more effectually than the medicines of the stimulating kind usually recommended for that purpose, partly perhaps by increasing plenitude, and partly by relaxing the solids or taking off spasmodic strictures. And indeed all the preceding effects are perhaps consequences of one general power; being nearly allied to those which natural sleep produces.

The operation of opium is generally accompanied with a slow but strong and full pulse,

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pulse, and a slight redness, heat, and itching of the skin: it is followed by a weak languid pulse, lowness of spirits, some difficulty of breathing, or a sense of tightness about the breast, a slight giddiness of the head, dryness of the mouth and fauces, and some degree of nausea. Given on a full stomach, it commonly occasions a nausea from the beginning, which continues till the opium is ejected along with the contents of the stomach. Where the evacuation of acrid humours, accumulated in the first passages, is suppressed by it, great sickness and uneasiness are generally complained of, till the salutary discharge either takes place again spontaneously, or is promoted by art.

Over dose occasions either immoderate or stupidity, a redness of the ring of the lips, relaxation of the joints, vertigo, deep sleep, with turbulent dreams and startings, convulsions, and cold sweats. Geoffroy observes, those who recover, are generally relieved by a diarrhoea, or by a profuse sweat, which is accompanied with a violent itching. The proper remedies, besides emetics, blisters, and bleeding, are acids and neutral mixtures: Dr. Mead says he has given, with extraordinary success, repeated doses of a mixture of salt of wormwood with lemon juice.

A long continued use of opium is productive of great relaxation and debility, sluggishness, heaviness, loss of appetite, dropics, tremors, acrimony of the humours, frequent stimulus to urine, and propensity to venery. On leaving it off, after habitual use, an extreme lowness of the spirits, languor, and anxiety, succeed; which are relieved by having again recourse to opium, and in some measure by spirituous or vinous liquors.

With regard to the dose, one grain is generally a sufficient, and sometimes too large a one: maniacal persons, and those who labour under violent spasms, require oftentimes two, three, or more grains; though even in these cases, it is generally more advisable to repeat the dose at proper intervals, than to enlarge it. By frequent use, much greater quantities may be borne; the Turks, who habituate themselves to opium as a succedaneum to spirituous liquors, are said to take commonly a dram at a time, and Garcias says, that he knew one who every day took ten drams.

Tinctures of opium in water, wine, and proof spirit, have the same effects as

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the opium in substance; with this difference, that they exert themselves sooner in the body, and are less disposed to leave a nausea on the stomach.

Many have endeavoured to correct certain ill qualities which they suppose opium to be possessed of, by roasting it, by fermentation, by long continued digestions, by repeated dissolutions and distillations. These kinds of processes, though recommended by several late writers, do not promise any singular advantage. That they weaken the opium is indeed very probable; but this intention is answered as effectually, and with far greater certainty, by diminishing the dose of the opium.

OPOBALSAMUM, in pharmacy, the same with the balsam, or balm of Gilead. See *Balsam*.

OPOPANAX, in the materia medica, a concrete gummy-resinous juice, from the roots of an umbelliferous plant, which grows spontaneously in the warmer countries, and bears the cold of our own. The juice is brought from Turkey and the East Indies, sometimes in little round drops or tears, more commonly in irregular lumps, of a reddish yellow colour on the outside, with specks of white, internally of a paler colour, and frequently variegated with large white pieces.

This gummy resin has a strong disagreeable smell, and a bitter, acrid, somewhat nauseous taste.

OPOPANAX, an useful attenuant and deobstruent, and in considerable doses loosens the belly. It is given from a scruple to a dram, in the same intentions as ammoniacum or galbanum: and joined in smaller doses as an auxiliary to those and the other deobstruent gums.

OPOSSUM, in zoology, a very singular animal, about fifteen inches long from the extremity of the nose to the rump; and its tail is equal in length to the whole body: the legs are robust, and the feet armed with sharp, long, and crooked claws. But what is most singular in this animal is, that the skin of the belly of the female is loose, forming a kind of pouch or bag, with an aperture in it, at which, in time of danger, it takes in its young.

OPPONENT, one who withstands or opposes another.

OPPOSITION, in logic, the disagreement between propositions, which have the same subject and the same predicate.

OPPOSITION, in astronomy, is that aspect or situation of two stars or planets,

wherein they are diametrically opposite to each other, or 180° asunder.

OPPOSITION, in rhetoric a figure whereby two things are joined, which seem incompatible.

OPTATIVE MOOD, in grammar, that which serves to express an ardent desire or wish for something.

In most languages, except the Greek, the optative is only expressed by prefixing to the subjunctive an adverb of wishing, as *utinam*, in Latin; *plus a Dieu*, in French, and *would to God*, in English; but in Greek, it is expressed by a peculiar inflection, *oius, ois, oi*, &c.

OPTIC, or **OPTICAL**, something relating to vision, or the sense of sight.

OPTIC Angle. See **Optic ANGLE**.

OPTIC Glasses are glasses ground either convex or concave, in order either to collect or disperse the rays of light; by means of which vision is improved, and the eye strengthened and preserved.

OPTIC Inequality, in astronomy, is the apparent irregularity in the motions of far distant bodies, but arising from the situation of the spectator's eye: so that, were the eye in the center, the motions would always appear uniform.

OPTIC Nerves, the second pair of nerves, springing partly from the extremity of the corpora striata, and partly from the thalami nervorum optici.

OPTICS, **OPTICA**, the science of direct vision. See **Vision**.

OPTICS is also used, in a larger sense, for the science of vision, or visibles in general; in which sense optics include catoptics, and dioptrics.

The general principle of optics, catoptics, and dioptrics, is as follows.

In simple optics the direct ray comes in the shortest direct way from the radiant point C (plate XXXVI, fig. 4) to the point to be enlightened E; namely, the medium remaining the same; that is, in the right line CE.

In catoptics, the angle of incidence CEA, and of reflection DEB, are equal: for let C be the radiant, D the point to be enlightened, and AB a plane speculum, the point E of the speculum reflecting the ray to D is sought; we say it is such that CE + ED is the least possible, and this will happen when the angle CEA and DEB are equal.

In dioptrics, the sines of the complements EM and EL of the angles of incidence CEA, and of refraction GEB, have always the same ratio, which is reciprocal to the resistance of the mediums.

Let IE be air, EK water, glass, or any other medium denser than air, CE the incident ray, and EG the refracted one; put m and n for the resistance, with respect to light and air; then the path CEG of the incident and refracted ray will be as the sum of the rectangles CE $\times m$ + EG $\times n$, and must be the least possible, or less than CE $\times m$ + FG $\times n$, assuming any other point F besides E. In order to find this point, we have the points C and G, as also the right-line AB given in position; therefore call the right lines perpendicular to the plane CH, c, and GL, g; and HL, which is also given, b ; put EH = y , then EL will be $b - y$, and CE = $\sqrt{cc + yy}$, which put equal to p ; and for EG, or $\sqrt{gg + yy - 2ny + bb}$, write q ; whence we have $n\sqrt{cc + yy} + m\sqrt{gg + yy - 2by + bb}$, or $mp + nq$, for the sum of the rectangles CE $\times m$ + EG $\times n$; which being put into fluxions, and properly reduced, gives $mgy = np \times b - y$, or np to mq as y to $b - y$; or the rectangle CE $\times n$, to the rectangle EG $\times m$, as EH to EL: therefore supposing CE and EG equal, n the resistance of the water, in respect of light, will be to m the resistance of air, as EH the sine of the complement of the angle of incidence CEA in air, to EL, the sine of the complement of the angle of refraction GEB in water; or the sines of the complements will be in the reciprocal ratio of the resistance of the mediums. If therefore EL, in one instance or experiment, be found to be two-thirds of EH, it will be also in all others, wherever C and G are taken, the former in air, the latter in glass; if E be in air, and G under water, EL will be three-fourths of EH nearly.

From this calculation we get the following construction.

Describe the circle CBG from the center E, with the radius EC or EG, and let CE meet its tangent at B produced in V, and EG in T; let the eye be in C, and the object which is seen under the water in T, and the point T will appear to be in V; because we seem to see it along the right line CEV; yet, since we really see it by the broken line CET, it is plain that EV is the secant of the angle of incidence CEA, or its equal VEB; and that ET is the secant of the angle of refraction GEB; but, from a known proposition in trigonometry,

metry, the secants are reciprocally as the sines-complement; therefore, directly, EV is to ET as EL to EH ; that is, as m to n . The eye at C therefore being in a different medium than the object T , the apparent ray EV in the medium of the object (water) is to the true ray ET in the same medium of the object (water) as m the resistance of the air, the medium of the eye, to n , the resistance of water, the medium of the object; which ratio, as it is always the same, the mediums remaining the same, the ratio therefore, between the true ray ET and the apparent ray EV , will be always the same, which agrees with a theorem given for the same purpose by Snellius.

In the same manner, seeing the ratio of EL and EH , the cosines of the angles of refraction and incidence, is reciprocal to the resistance of the mediums; it will always be the same, which is Des Cartes theorem, deduced from principles very different to those made use of by Snellius. This coincidence of conclusions arising from such different principles, made Spleffius, a man very conversant in these studies, doubt whether Des Cartes, when in Holland, had not seen Snellius's theorem; for he observes that it was a common thing with him to omit the names of authors; and he gives his Vortices as an instance, at which Jordanus Brunus and Joh: Kepler had hinted in such a manner, that they seem to have only wanted that term: add to this, that Des Cartes setting about to demonstrate this theorem by his own skill, fell into great difficulties: for, because he saw that the ray CE carried from air into water, is there refracted in EG , and that towards the perpendicular EK ; and therefore rendered more similar to that ray (whose action is stronger), namely, the perpendicular ray, he suspected that it met with less resistance in water, or glass, than in air: whereas, supposing the contrary, which is much more agreeable to reason, and employing that general principle, viz. that nature in all its operations takes the nearest ways; we may arrive at the same conclusion. Whence Fermat rightly observed, that Des Cartes had not given the true reason of his theorem; and likewise the comparison by which he endeavours to illustrate his explication is but little to the purpose. Let the ball A (fig. 5.) running on a smooth table BC , in the place A , meet in the middle of its course part of the table DE , covered with tapestry, when it will run slower in

2 A. In the same manner, therefore, he thinks, that glass, or any other solid body, less hinders the rays of light than air, which is not so smooth; but (not to mention that the parts of water are sufficiently yielding, according to Des Cartes himself) it is sufficient to consider that the ball, when it comes from 2 A, after having passed over the tapestry DE , again comes to a smooth part of the table in 2 A, and cannot there recover its former celerity, which it had in 1 A, before it meets the tapestry; yet, since the ray of light does again enter from a greater resisting medium into a less resisting medium similar to the first, and recovers its former state; and supposing that the surfaces of two similar mediums, to wit, the first and the last, be parallel plains, it may receive a direction by the latter refraction, parallel to that which it had before the former refraction.

The manner in which Des Cartes explains both reflection and refraction of light, in imitation of the motion of other bodies, seems to be worthy of his genius, and not to be rejected but only amended; for, as to reflexion, he should have in the first place explained, why any ball as I (fig. 6.) falling along the perpendicular IE on the plane AB is from thence reflected: for we observe that some bodies, namely, such as are soft, are not equally reflected, the true cause of which reflexion is the elasticity either of the ball or plane, or both; for an elastic plane will yield a small matter, as we observe a stretched membrane or inflated bladder does to a falling pebble. And indeed, it will yield so much the more as the stroke is stronger; and restoring itself with so much the greater force, it reflects the impinging body towards the same parts, and with the celerity it came: for although Des Cartes would not admit of this explication of reflexion, advanced by some of his contemporaries, as appears from his letters; yet at this time it is verified, both by reason and by experiment. Since therefore the ball comes from C to E in the right line CE , and consequently with a motion compounded of two others, to wit, the horizontal, as CI or HE , by which it comes from CH to IE , and the perpendicular, as CH or IE , by which it comes from CI to HE , both beginning at C and terminating in E : and as the surface AB does not oppose, but is parallel to its horizontal conatus, coming into E from CH towards IE in the right line CI or HE ; it will there-

therefore retain unchanged both the celerity and direction of its horizontal motion; and the same space of time it spent in coming from CH to IE, it will likewise spend in coming from EI to RD, supposing the intervals between CH and IE, as also between IE and RD, to be equal: but the perpendicular motion whereby it came from CI to HE, retaining its velocity, will be changed into the contrary direction, that it may spend as much time in which it may return from ER to ID. Since therefore ER is equal to EH, and RD to CH, the triangles CHE and DRE will be similar and equal; and consequently, the angle DEB will be equal to the angle CEA. All this will be more manifest, if we suppose the ruler CID parallel to the surface AB, and retaining its parallelism through CH and DR to impinge on AB in HR, while in the mean time a ball in the ruler CI is carried from C to I; whence in reality the whole compound motion of the ball will be in the diagonal CE: but the ruler CID reflected by the solid surface AB will return with the same celerity, and by the same way it came, and in an equal time will again come to CID; while in the mean time the ball continuing its motion in the ruler, has advanced with the same celerity: and therefore in the same time arrives from I to D through ID = to CI; for the celerity remaining the same, equal spaces are run over in equal times: the ball, therefore, with a motion compounded of its own motion upon the ruler through ID, and that of the ruler along EI, to wit, returning from HR to CD, will be carried from E to D along the right line ED.

In order to explain refraction, we are to consider that the greater resisting medium to light (y^t without opacity) seems to be that which more obstructs the diffusion or distribution of light through more parts of the medium: and it may be called less illuminable; for the nature of light endeavours to diffuse itself. On the contrary, by how much more the light equally affects the parts of the medium it illuminates, or communicates its force to a great number of small particles of the illuminated place, the medium will be the more illuminable, and less resist light: whence the more solid and small the parts of the medium affected by light are, or the less space they leave between them for another heterogeneous matter, not affected by light, the medium

will be said to be the more illuminated. But it appears from mechanical principles, that the same stroke impressed on several bodies at the same time, communicates a less force than if the stroke had been given to one of them: it will, therefore, happen, that in a medium which more resists the diffusion of light, or which is affected in a less number of its parts, each part is so much the more strongly affected: in a more illuminable medium more parts are affected, but weaker and with a more languid impressed stroke. Assuming now the motion of the ball instead of the ray, and supposing the ball coming from G to E, there to impinge on a medium, which shall retard its celerity or impetus; suppose in a sesquialteral ratio. If, therefore, in a minute of time it comes from G to E in the former medium KE, in the new medium EI the small ball will come from E to C in a minute and a half, supposing EC and GE to be equal in whatever point C is. But since the surface AB that separates the mediums shall not oppose the horizontal celerity in GK, LE, and the parallels thereof upon the ball's first entering into the new medium EI, or in the very point E (for the horizontal motion LEH only grazes along the separating surface AB) but in the first moment of its entering, or in the point E (considering the ball as indefinitely small like a point, as rays themselves are usually considered without breadth) the inclination of the line CE is to be presently determined. It is, therefore, to be taken at the very first; so that, in respect of the horizontal motion, the velocity may remain the same; and such as it was assumed at the beginning of its ingress into the new medium, such it remains therein: the ball, therefore, while it went in the former medium from G to E, had passed over in a minute of time with the horizontal direction the interval GK or LE (between GL and KE); it now in a minute and half of time, in which it should move from E to C, will accomplish in the same horizontal direction the interval EH, or IC (comprehended between EI and HC), which ought to be sesquialteral of the former LE, because the horizontal velocity remaining the same, which is not changed by refraction, the spaces are as the times: EH, therefore, is to EL in the direct ratio of the times, or the reciprocal ratio of the celerities or resistances; for we have shewn in the case of the

the light, whose diffusion is impeded by the resistance of the medium, that the velocity or impetus increases according to the resistance, and languishes according to the greater facility of diffusing itself in each part. On the contrary, that the ray recovers its force, and consequently its direction, when again it comes into a medium where there is a less diffusion, and more rays are employed in impelling a fewer number of parts; and this recovery Des Cartes, as we have mentioned before, could not explain by his comparison of the tapestry, or any rough body.

Euclid has written on the ancient optics and catoptrics: dioptrics were unknown to them. F. Honorat. Fabri has an abridgement of optics, catoptrics, and dioptrics. Father Eschinard has given a century of problems in optics. Vitellio and Alhazen have performed well on the element of optics. Father Kircher has a large volume on the secrets of optics, of light, and shadow, and their surprising effects, which pass on the people for magic. We have also *L'Optique & Catoptrique* of father Mersenne, Paris 1641. *Dioptrique Oculaire* of father Cherubin, Paris 1651, fol. Christ. Sheineri *Optica*, London, 1652. Jacobi Gregorii *Optices*. Barrovii *Lectiones Opticæ*, London, 1665. John Bapt. Porta *de Refractione Opticæ*, London 1669. *Principe generale de l'Optique*, by M. Leibnitz, in the *Leipfic Acts*, 1682. *L'Oeciale all'chio*, or *Dioptrica Practica*, Carol. Ant. Mancini, Bologna, 1660, 4°. *Physico-mathestis de Lumine Coloribus, & Irde*, per F. Mar. Grimaldi, Bononiæ, 1665, 4°. *Cogitationes Physico-mechanicæ de Natura Visionis*, per Joh. Ott. Scaphusam, Heidel. 1670, 4°. And, which ought to be named first, the great Sir Isaac Newton's *Optics*, Latin and English, 4° and 8°.

OPULUS, the water-elder, in botany, a genus of plants.

OPUNTIA, Indian fig, in botany, a species of cactus, distinguished by being ramose and dichotomous.

It is on this plant that the cochineal animal feeds.

OR, in heraldry, denotes yellow, or gold colour. It is represented in engraving by small points or dots, scattered all over the field or bearing.

ORACLE, among the heathens, the answer which the gods were supposed to give to those who consulted them upon any affair of importance; it is also used for the god who it was thought gave the

answer, and the place where it was given. The credit of oracles was so great, that in all doubts and disputes their determinations were held sacred and inviolable; and no business of any consequence was undertaken, scarce any peace concluded, any war waged, or any new form of government instituted, without the advice and approbation of some oracle. The answers were usually given by the intervention of the priest or priestess of the god who was consulted, and generally expressed in such dark and indeterminate phrases, as might easily be wrested to prove the truth of the oracle, whatever was the event. It is not, therefore, to be wondered at, that the priests who delivered them were in the highest credit and esteem; and that they improved this reputation greatly to their advantage. They accordingly allowed no man to consult the gods, before he had offered costly sacrifices, and made rich presents to them. And to keep up the veneration for their oracles, and to prevent their being taken unprepared, they admitted persons to consult the gods only at certain stated times; and sometimes they were so cautious, that the greatest persons could obtain no answer at all. Thus Alexander himself was peremptorily denied by the pythia, or priestess of Apollo, till she was, by downright force, obliged to ascend the tripod; when, being unable to resist any longer, she cried out, "Thou art invincible;" and these words were accepted instead of a farther oracle. The principal oracles of antiquity were, 1. The oracle of Dodona, where there was a temple consecrated to Jupiter: the priests who delivered these oracles were called felli; but in later ages they were pronounced by three old women. Near the temple of Dodona was a sacred grove of oaks, which were said to be endued with a human voice, and a prophetic spirit; the reason of which fiction seems to have been, that the priests often concealed themselves within the hollow of these trees, and from thence delivered oracles. 2. The oracle of Olympian Jupiter at Elis. 3. The oracle of Apollo at Delphi, where it was pretended that an inspiring vapour arose from the mouth of a deep cavern, on which the pythia being placed on a three-legged stool, received the divine afflatus, and became inspired: this oracle was the most famous of all others. 4. The oracle of Trophonius, at Lebadea, a city in Boeotia, at which, after a number of ceremonies were performed,

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formed, the votary descended into Trophonius's cave, where future events were revealed to him in a very extraordinary manner. It is remarkable, that all who consulted this oracle seemed to be frightened out of their senses; for some time after, they became pensive and melancholy, their tempers were sowered, and their countenances, however gay and pleasant before, were rendered dull and heavy.

5. The oracle of Amphiaraus, the answers of which were delivered in dreams, while the person slept on the skin of the victim he had sacrificed.

6. That of Mercury, at Pharae, a city of Achaia, where those who wanted information, after offering frankincense upon the altar, and presenting a piece of money, placed their ear to the statue, and then stopping both ears till they were at some distance, took away their hands, and received the first voice they heard as a divine oracle.

7. The oracle of Hercules at Bura, where was a cave, in which was placed the statue of Hercules: here they who consulted the god, first addressed themselves to him by prayer; then taking four dice out of a great heap that lay ready, they threw them upon the table, and as all the dice had particular marks, they were interpreted, and the answer given by consulting a book kept for that purpose.

8. At Patrae, a city on the sea-coast of Achaia, was a temple of Ceres, before which was a fountain which delivered oracles only on the event of diseases, by letting down a looking-glass so low, that the bottom might just touch the surface of the water; when from the various figures represented in it, conjectures were formed concerning the patient. Besides these, there were several others, as that of Aesculapius at Epidaurus, that of Bacchus at Amphiclea, that of Orpheus's head at Lesbos, &c.

ORAL, something delivered by word of mouth; in which sense we say, oral law, oral tradition, &c.

ORANGE, a delicious fruit of the apple kind, too well known to need description.—This fine tree not being natural to our climate, we must quicken the nature of our soil with a composition that may cause it to correspond as much as possible with the temperament of warmer countries. It delights greatly in a soil that is composed of an equal quantity of sheep's dung, that has rested two years; old compost, or the soil of a fever; and fat land taken either from a marsh or hemp-closet. Oranges are

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brought from several parts. The best and most in esteem for a good taste are those which grow in hot countries; not only because the soil of the places, having plenty of exalted sulphur and volatile salts in it, communicates a great quantity of the same to these fruits, and gives them an agreeable smell, but because the heat of the sun there digests, and more completely ripens their juice, and gives them a more delicious taste. The juice of the orange is sharp, because this salt is but little embarrassed with the rosy parts; which is the reason it communicates almost all its acidity to the little nervous fibres of the tongue. As for the juice of the sweet oranges, as it contains less salt than that of the sour ones, and as this salt is kept under by a great quantity of oily parts, it is easy to be understood that it can make but a slight impression on the parts it touches. They prefer the juice of the sour orange in medicinal use to the other, as we have before observed, for cooling, moistening, and mitigating fevers; because this juice has more of the acid in it, and can more easily thicken the over-thinned liquors, allay their violent motions, and keep down those sharp humours that throw them into an extraordinary fermentation.

ORANGERY, in gardening, a gallery exposed to the south, well closed with glass windows, to preserve orange-trees in winter. It likewise denotes the parterre where the orange-trees are exposed in kindly weather.

ORATION, in rhetoric, a speech or harangue, composed according to the rules of oratory, and spoken in public.

ORATORIO, in the Italian music, a sort of sacred drama of dialogues; containing recitatives, duettos, trios, ritornellos, choruses, &c. The subjects of these pieces are usually taken from the scriptures.

ORATORY, *Oratoria*, the art of speaking well, otherwise called rhetoric.

ORATORY, among the Romanists, a closet or small apartment near a bed-chamber, furnished with an altar, crucifix, &c. for private devotion.

ORB, *Orbis*, in astronomy, an hollow globe or sphere. See *Globe* and *Sphere*.

ORBICULAR OS, in anatomy, a little bone of the ear, so called from its figure.

ORBICULARIS, in anatomy, an appellation given to the constrictor muscles of

of the lips; as also to the constrictor of the upper eye-lid.

ORBIS MAGNUS, in astronomy, denotes the earth's orbit, in its annual revolution round the sun.

ORBIT, *Orbita*, in astronomy, the path described by a planet about the sun. The orbits of all the planets are ellipses, having the sun in their common focus; but the elliptic orbit of the earth, by the action of the moon, is sensibly disfigured, as also the orbit of Saturn by the action of Jupiter, when they are in conjunction.

ORCHARD, a seminary, or plantation of fruit-trees. It is a rule among gardeners, says Mr. Miller, that those orchards thrive best which lie open to the south, south-west, and south-east, being screened from the north, and have the soil dry and deep.

In planting of an orchard, great care should be had to the nature of the soil, that such trees as are adapted to grow upon the ground intended to be planted, may be chosen, otherwise there can be little hopes of their succeeding; and it is for want of rightly observing this method, that we see, in many countries, orchards planted which never arrive to any tolerable degree of perfection, their trees starving, and their bodies either covered with moss, or the bark cracks and divides; both which are evident signs of the weakness of the trees; whereas, if instead of apples the orchard had been planted with pears, cherries, or any other sort of fruit to which the soil had been adapted, the trees might have grown very well, and produced great quantities of fruit.

As to the position of the orchard, if you are at full liberty to chuse, a rising ground, open to the south-east, is to be preferred; but I would by no means advise to plant upon the side of an hill, where the declivity is very great; for in such places the great rains commonly wash down the better part of the ground, whereby the trees would be deprived of proper nourishment; but where the rise is gentle, it is of great advantage to the trees, by admitting the sun and air between them, better than it can upon an entire level; which is an exceeding benefit to the fruit, by dissipating fogs, and drying up the damps, which, when detained amongst the trees, mix with the air, and render it rancid: if it be defended from the west, north, and east winds, it will also render this situation still more advantageous; for it is chiefly from these

quarters that fruit-trees receive the greatest injury: therefore, if the place be not naturally defended from these by rising hills, which is always to be preferred, then you should plant large growing timber-trees at some distance from the orchard, to answer this purpose.

You should also have a great regard to the distance of planting the trees, which is what few people have rightly considered; for if you plant them too close, they will be liable to blights; and the air being hereby pent in amongst them, will cause the fruit to be ill-tasted, having a great quantity of damp vapours from the perspiration of the trees, and the exhalations from the earth mixed with it, which will be imbibed by the fruit, and render their juices crude and unwholesome.

Wherefore I cannot but recommend the method which has been lately practised by some particular gentlemen with very great success; and that is, to plant the trees four score feet asunder, but not in regular rows. The ground between the trees they plough and sow with wheat and other crops, in the same manner as if it were clear from trees; and they observe their crops to be full as good as those quite exposed, except just under each tree, when they are grown large, and afford a great shade; and, by thus ploughing and tilling the ground, the trees are rendered more vigorous and healthy, scarcely ever having any moss, or other marks of poverty, and will abide much longer, and produce better fruit.

If the ground in which you intend to plant an orchard has been pasture for some years, then you should plough in the green sward the spring before you plant the trees: and, if you will permit it to lie a summer fallow, it will greatly mend it, provided you stir it two or three times, to rot the sward of grass, and prevent weeds growing thereon.

At Michaelmas you should plough it pretty deep, in order to make it loose for the roots of the trees, which should be planted thereon in October, provided the soil be dry; but if it be moist, the beginning of March will be a better season.

When you have finished planting the trees, you should provide some stakes to support them, otherwise the wind will blow them out of the ground; which will do them much injury, especially if they have been planted some time; for the ground at that season being warm, and for the most part moist, the trees

will very soon push out a great number of young fibres; which, if broken off by their being displaced, will greatly retard the growth of them.

In the spring following, if the season should prove dry, you should cut a quantity of green turf, which must be laid upon the surface of the ground about their roots, turning the grass downward; which will prevent the sun and wind from drying the ground, whereby a great expence of watering will be saved: and, after the first year, they will be out of danger, provided they have taken well.

Whenever you plough the ground between these trees, you must be careful not to go too deep among their roots, lest you should cut them off, which would greatly damage the trees: but, if you do it cautiously, the stirring of the surface of the ground will be of great benefit to them; though you should observe never to sow too near the trees, nor suffer any great rooting weeds to grow about them, which would exhaust the goodness of the soil, and starve them.

If, after the turf which was laid round the trees be rooted, you dig it in gently about the roots, it will greatly encourage them. There are some persons who plant many sorts of fruit together in the same orchard, mixing the trees alternately; but this is a method which should always be avoided; for hereby there will be a very great difference in the growth of the trees, which will not only render them unsightly, but also the fruit upon the lower trees ill-tasted, by the tall ones overshadowing them; so that, if you are determined to plant several sorts of fruit on the same spot, you should observe to place the largest growing trees backwards, and so proceed to those of less growth, continuing the same method quite through the whole plantation; whereby it will appear at a distance in a regular slope, and the sun and air will more equally pass through the whole orchard, that every tree may have an equal benefit therefrom.

The soil of your orchard should also be mended once in two or three years with dung, or other manure, which will also be absolutely necessary for the crops sown between; so that where persons are not inclinable to help their orchard, where the expence of manure is pretty great, yet, as there is a crop expected from the ground besides the fruit, they will the more readily be at the charge upon that account.

In making choice of trees for an orchard, you should always observe to procure them from a soil nearly a-kin to that where they are to be planted, or rather poorer; for, if you have them from a very rich soil, and that wherein you plant them is but indifferent, they will not thrive well, especially for four or five years after planting; so that it is a very wrong practice to make the nursery, where young trees are raised, very rich, when the trees are designed for a middling or poor soil. The trees should also be young and thriving; for, whatever some persons may advise to the contrary, yet it has always been observed, that though large trees may grow, and produce fruit, after being removed, they never make so good trees, nor are so long-lived, as those which are planted while young.

These trees, after they are planted out, will require no other pruning but only to cut out dead branches, or such as cross each other, so as to render their heads confused and unsightly: the too often pruning them, or shortening their branches, is very injurious, especially to cherries and stone-fruit, which will gum prodigiously, and decay in such places where they are cut: and the apples and pears which are not of so nice a nature, will produce a greater quantity of lateral branches, which will fill the heads of the trees with weak shoots, whenever their branches are thus shortened; and many times the fruit is hereby cut off, which, on many sorts of fruit-trees, is first produced at the extremity of their shoot.

It may, perhaps, seem strange to some persons, that I should recommend the allowing so much distance to the trees in an orchard, because a small piece of ground will admit of very few trees, when planted in this method: but they will please to observe, that when the trees are grown up, they will produce a great deal more fruit than twice the number when planted close, and will be vastly better tasted; the trees, when placed at a large distance, being never so much in danger of blighting as in close plantations, as hath been observed in Herefordshire, the great county for orchards, where they find that when orchards are so planted or situated, that the air is pent up amongst the trees, the vapours which rise from the damp of the ground, and the perspiration of the trees, collect the heat of the sun, and reflect it in streams so as to cause what they call a fire-black,



Fig. 1 Rustic.

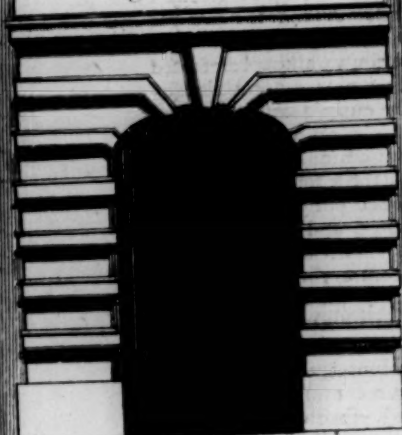


Fig. 2 Tuscan.

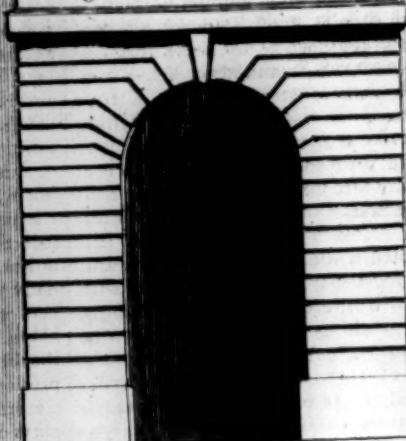


Fig. 3 Doric.



Fig. 4 Ionic.

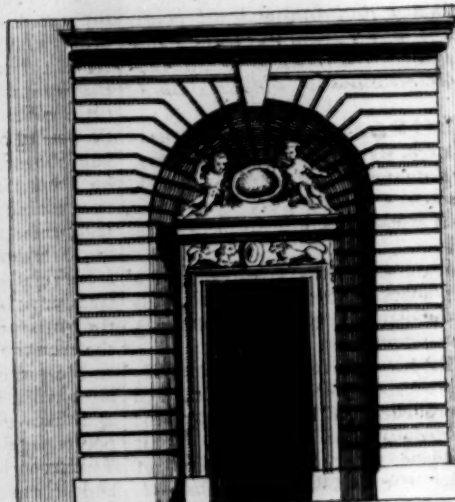
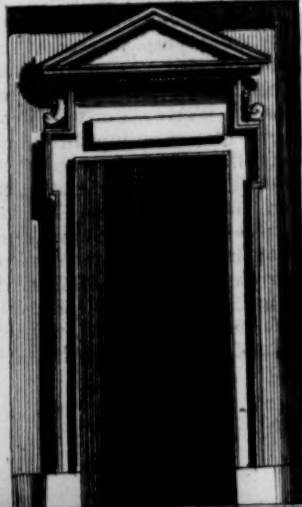


Fig. 5 Corinthian.



Fig. 6 Composite.



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blast, which is the most hurtful to their fruit; and this is most frequent where the orchards are open to the south sun.

But, as orchards should never be planted, unless where large quantities of fruit are desired, so it will be the same thing to allow twice or three times the quantity of ground; since there may be a crop of grain of any sort upon the same place, as was before said, so that there is no loss of ground: and, for a family only, it is hardly worth while to plant an orchard, since a kitchen-garden well planted with espaliers will afford more fruit than can be eaten while good, especially if the kitchen-garden be proportioned to the largeness of the family: and, if cyder be required, there may be a large avenue of apple-trees extended cross a neighbouring field, which will render it pleasant, and produce a great quantity of fruit; or there may be some single rows of trees planted to surround the fields, &c. which will fully answer the same purpose, and be less liable to the fire-blasts before-mentioned. *Miller's Gard. Dict.*

ORCHESTRA, in the ancient theatres, a place in the form of a semi-circle, where the dancing was performed; and, in the modern theatres, &c. where the music, both vocal and instrumental, is performed.

ORCHIS, fool's stones, in botany, a genus of plants. Orchis root abounds with a glutinous juice, good for blunting acid ferous humours.

ORDEAL, a form of trial formerly practised over almost all Europe, and which prevailed in England from the time of Edward the Confessor, till it was abolished by a declaration of Henry III. It was called *purgatio vulgaris*, or *judicium*, in opposition to *bellum*, or combat, the other form of purgation, and was of various kinds, as that of fire, that of red-hot iron, that of water, that of judicial pottage, that of hallowed cheese, that of the green cross, and that of dice laid on relics covered with a woollen cloth. To each of which kinds particular masses were appointed. In England, an offender, on being arraigned, and pleading not guilty, had it in his choice to put himself upon God and his country; that is, upon the verdict of a jury; or upon God alone, on which account it was called the judgment of God, it being presumed that God would deliver the innocent. The more popular kinds of ordeal were those of red-

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hot iron and water; the first for freemen and people of fashion, and the last for peasants. That by fire, as practised here, was the person's walking barefooted and blindfold over nine red-hot ploughshares; and if he escaped unhurt, he was acquitted, otherwise condemned. That of water was of two kinds, viz. either of hot water or cold; the former was where the person suspected put his arm or leg into scalding water, and brought it out unhurt; and the latter was when his body was not, contrary to the course of nature, borne up by the water.

ORDER, in architecture, a system of the several members, ornaments, and proportions of columns and pilasters; or a regular arrangement of the projecting parts of a building, especially the column, so as to form one beautiful whole.

M. Le Clerc defines an order to be a column charged with an entablature, and supported on a pedestal. The origin of orders may be said to be almost as ancient as human society. The rigour of the seasons first put men upon making little cabbins to retire into: at the first they were made half under ground, and half above, and were covered with stubble; but, in time growing more expert, they placed trunks of trees on end, and laid others a-cross, to bear up the covering. From hence they took the hint of more regular architecture, the trunks of trees upright representing columns; and the girds or bands which served to keep the trunks from bursting, expressed bases and capitals; and the summers which lay a-cross, gave the hint of entablatures; and likewise, the coverings, ending in points, gave a notion of pediments. This hypothesis we have from Vitruvius, and it has been well illustrated by M. Blondel. See *Column*, &c. Others are of opinion, that columns take their rise from the pyramids which were erected by the ancients over tombs; and that the urns wherein their ashes were inclosed, represented the capitals, the abacus of which was a brick laid over to cover the urn: but Vitruvius's account seems the most natural. See *Abacus*, &c. In time, the height of columns was regulated by the Greeks on the foot of the proportion of a human body. The Doric represented a man of a strong robust make, the Ionic that of a woman, and the Corinthian that of a girl; their bases and capitals were their shoes, head-dress, &c. The three Greek orders represent three different manners of building, viz. the solid,

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mean, and delicate; the two Italian ones are imperfect productions of these.

To give a general idea of the orders, it will be necessary to observe, that the whole is composed of two parts, at least, viz. the column and the entablature, and of four parts, at the most, where there is a pedestal under the column, and one acroter, or little pedestal, on the top of the entablature. That the column has three parts, viz. the base, the shaft, and capital; the entablature has three likewise, viz. the architrave, the frieze, and the cornice; which parts are all different in the several orders, having each their particular characters and members, called by the general names of mouldings or ornaments. See *Base*, &c.

These orders took their names from the people among whom they were invented. Scamozzi calls the Tuscan, the gigantic; the Doric, the Herculean; the Ionic, the matronal; the Composite, the heroic; and the Corinthian, the virginal.

An order of columns is usually understood of a column bearing its entablature; but the order is scarcely complete, except the column be raised on a pedestal.

The pedestal, column, and entablature, are three compound parts, each consisting of three others, as has been said before.

The ancients have given us five several orders of columns, the Tuscan, Doric, Ionic, Composite, and Corinthian.

We have already given a plate of the five orders, and shall here add one of doors adapted to the different orders. See plate xxxviii where *fig. 1.* is a door according to the Rustic taste. *Fig. 2.* A door of the Tuscan order. *Fig. 3.* A door of the Doric order. *Fig. 4.* A door of the Ionic order. *Fig. 5.* A door of the Corinthian order; and *fig. 6.* a door of the Composite order.

Disposition of the ORDERS. These ought to be so disposed in building, that the most solid may be placed undermost, as the most proper to sustain the weight, and to give the whole edifice a more firm foundation: therefore the Doric must always be placed under the Ionic, the Ionic under the Corinthian, and the Corinthian under the Composite. As to the Tuscan, being a plain rude order, it is seldom used above ground except in villas, where one order only is employed. In very large buildings, as amphitheatres, where many orders are required, the Tuscan may be placed under the

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Ionic instead of the Doric. But if you are desirous to leave out any of these orders, as for instance, to place the Corinthian immediately over the Doric, you may, provided you always observe to place the most strong and solid undermost, for the reasons above-mentioned.

ORDER, a division or class of any thing: thus, the tribe of animals called birds, is subdivided into six orders.

Holy ORDERS, a character peculiar to ecclesiastics, whereby they are set apart for the ministry.

Military ORDERS, companies of knights, instituted by kings and princes; either for defence of the faith, or to confer marks of honour, and make distinctions among their subjects.

Religious ORDERS, congregations or societies of monastics, living under the same superior, and wearing the same habit.

ORDERS of Curves, in geometry. See *Curves*.

ORDINANCE, or **ORDONNANCE**, a law, statute, or command of a sovereign, or superior.

ORDINARY, in general, signifies common, or usual; thus, an ambassador or envoy in ordinary, is one sent to reside stately, and for a number of years, in the court of some foreign prince or state, in order to keep up a good understanding, and watch over the interest of his own nation. This term is also applied to several officers in the king's household, who attend on common occasions, Thus we say, physician in ordinary, &c.

ORDINARY, in civil law, any judge invested with authority to take cognizance of causes in his own right, and not by deputation.

ORDINARY, in common and canon law, one who has ordinary or immediate jurisdiction in ecclesiastical causes in such a place.

ORDINARY, or *Honourable ORDINARY*, in heraldry, a denomination given to certain charges properly belonging to that art. The honourable ordinaries are ten in number, viz. the chief, pale, bend, fesse, bar, cross, saltier, chevron, bordure, and orle.

ORDINATES, or **ORDINATE APPLICATES**, in geometry, parallel lines, terminating in a curve, and bisected by a diameter. The half of these is properly the semi-ordinate, though commonly called ordinate.

ORDINATION, the act of conferring holy orders, or of initiating a person

San into the priesthood. Ordination has always been esteemed the principal prerogative of bishops, and they still retain the function as a mark of spiritual sovereignty in their diocese. Without ordination, no person can receive any benefice, parsonage, vicarage, &c. A clerk must be twenty-three years of age before he can have any share in the ministry; and twenty-four, before he can be ordained priest, and by that means be permitted to administer the sacraments. A bishop, on the ordination of clergymen, is to examine them in the presence of the ministers who assist him at the imposition of hands; and in case any crime, as drunkenness, perjury, forgery, &c. be alleged against any one that is to be ordained, either priest or deacon, the bishop ought to desist from ordaining him. The person to be ordained is to bring a testimonial of his life and doctrine to the bishop, and give an account of his faith in Latin; and both priests and deacons are obliged to subscribe the Thirty-nine Articles.

ORDNANCE, a general name for all sorts of great guns used in war. See *Canon and Gun*.

ORDONNANCE, or **ORDINANCE**, in painting, is used for the disposition of the parts of a picture, either respecting the whole piece, or to the several parts; as the groups, masses, contralls, aspects, &c.

ORE, in natural history, the mineral glebe, earth, or stone dug out of the mines, to be purified, and have the metalline particles separated from it.

ORGAN, *organon*, in general, an instrument, or machine designed for the production of some certain action or operation; in which sense, the mechanic powers, machines, and even the veins, arteries, nerves, muscles, and bones of the human body, may be called organs. The organs of sense are those parts of the body, by which we receive the impressions or ideas of external objects; being commonly reckoned five, viz. the eye, ear, nose, palate, and cutis.

ORGAN, in music, the largest and most harmonious wind-instrument, and is become common in churches.

The invention of the organ is very ancient, though it is agreed that it was very little used till the eighth century. It seems to have been borrowed from the Greeks. Vitruvius describes an hydraulic one in his tenth book of Architecture.

St. Jerome mentions one with twelve pair of bellows, which might be heard a

thousand paces, or a mile; and another at Jerusalem, which might be heard at the mount of Olives.

There is one in the cathedral church of Ulm, in Germany, that is ninety-three feet high; and twenty-eight broad; the largest pipe is thirteen inches in diameter, and it has sixteen pair of bellows.

Hydraulic ORGAN, a musical machine that plays by means of water instead of wind. Of these there are several in Italy in the grottos of vineyards.

ORGANICAL Part, that part of an animal, or plant, destined for the performance of some particular function.

ORGASM, *Orgasmus*, an ecstasy, or impetuous desire of coition, occasioned by a turgescence of the seminal vessels.

ORGIA, *orgia*, in antiquity, feasts and sacrifices performed in honour of Bacchus, instituted by Orpheus, and chiefly celebrated on the mountains by wild, distracted women, called *Bacchæ*.

ORGUES, in the military art, thick, long-pieces of wood pointed at one end, and shod with iron, clear one of another; hanging each by a particular rope, or cord, over the gate-way of a strong place, perpendicularly, to be let fall in case of an enemy.

ORGUES is also used for a machine, composed of several barquebusts on musquet-barrels, bound together, by means whereof several explosions are made at the same time, used to defend breaches and other places attacked.

ORIENTAL, situated towards the east, with regard to us, in opposition to occidental.

ORIFICE, the mouth or aperture of a tube, pipe, or other cavity. In anatomy, this term is particularly applied to the mouths of the several ducts, vessels, and other cavities, as of the bladder, uterus, stomach, &c.

It is also used for the aperture of a wound or ulcer.

ORIGANUM, wild marjoram, in botany. It grows wild on dry chalky hills and gravelly grounds, in several parts of England, and flowers in June. The flowers, or rather flowery tops, of a somewhat different species, *origanum Creticum*, were formerly brought from Candy, but have long given place to those of our own growth, which are nearly of the same quality. The leaves and flowery tops of origanum have an agreeable aromatic smell, and a pungent taste, warmer than that of the garden marjoram, and much resembling thyme; with which they appear to agree in medicinal

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dicinal virtue. Infusions of them are sometimes drank as tea, in weakness of the stomach, disorders of the breast for promoting perspiration and the fluid secretions in general; they are sometimes used also in nervine and anti-rheumatic baths; and the powder of the dried herb as an erethine. Distilled with water, they yield a moderate quantity of a very acrid penetrating essential oil, smelling strongly of the origanum, but less agreeable than the herb itself; this oil is applied on a little cotton for easing the pains of carious teeth; and sometimes diluted and rubbed on the nostrils, or stuffed up the nose, for attenuating and evacuating mucous humours.

ORIGINAL, a first draught or design of any thing, which serves as a model.

ORIGINAL SIN, the crime of eating the forbidden fruit, of which it is said, all mankind are guilty at their conception, by the imputation of Adam's transgression; which is accounted for by supposing that Adam, as he was to be the father, was also the representative of the whole human race; and that on his sinning, all that were to spring from him partook of his crime.

ORILLON, in fortification, a small rounding of earth faced with a wall; raised on the shoulder of those bastions that have casemates, to cover the cannon in the retired flank, and prevent their being dismounted by the enemy.

ORION, in astronomy, a constellation of the southern hemisphere; consisting of thirty-seven stars, according to Ptolemy; of sixty-two, according to Tycho; and of no less than eighty, in the Britanic catalogue.

* **ORLEANS**, a large city of France, and capital of the Orleanois, with a university for the study of the law. It is one of the largest and most pleasant cities in the kingdom. It has six gates besides four posterns. The streets are small and narrow, except some few which are straight; but the principal street is broad as well as long. There are four large squares, including the market-place, and the cathedral is one of the finest in the kingdom. There are twenty-two parishes. The bridge of Orleans is built with stone in a handsome manner, and has 16 arches, which terminate at the suburbs. On this bridge is a statue of the Virgin Mary in bronze, holding her son in her arms, who is supposed to be just going to be laid in the sepulchre; on the one side is Charles VII. in armour on his knees, and on the other the Maid of

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Orleans, dressed like a man, and in armour. They every year make a feast to the memory of that heroine on the 12th of May, at which time they march in a solemn procession. The city of Orleans was besieged by the English in 1419, when Joan of Arc drove them away. It has suffered much in the religious wars. It is 32 miles N. E. of Blois, 60 N. E. of Tours, and 67 S. E. of Paris. Long. 2. 16. E. Lat. 47. 50 N.

ORNAMENTS, in architecture, are used to signify all the sculpture or carved-work wherewith a piece of architecture is enriched.

Vitruvius and Vignola also use the word to signify the entablature.

ORNITHOLOGY, that branch of zoology which treats of birds.

Linnaeus arranges the whole class of birds under six orders, according to the different figures of their beaks, viz.

1. The accipitres, or birds with uncinated or hooked beaks.
2. The picæ, or birds that have convex and compressed beaks.
3. The anseres, comprehending such birds as have depressed, and denated or serrated beaks.
4. The scolopaces, or those furnished with subcylindric and obtuse beaks.
5. The gallinæ, or birds which have the beak of a conic form, but crooked, and the upper chap imbricated.
6. The passeræ, or birds with conic and sharp-pointed beaks.

In the description of birds, the feet, wings, and tail are chiefly attended to.

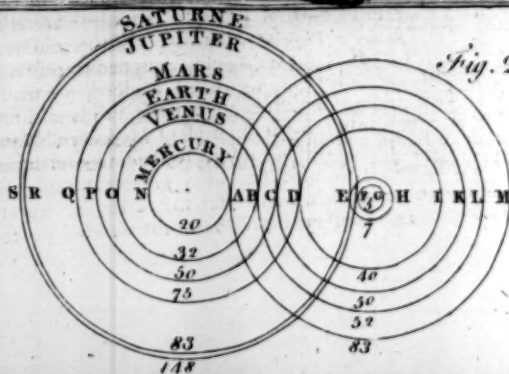
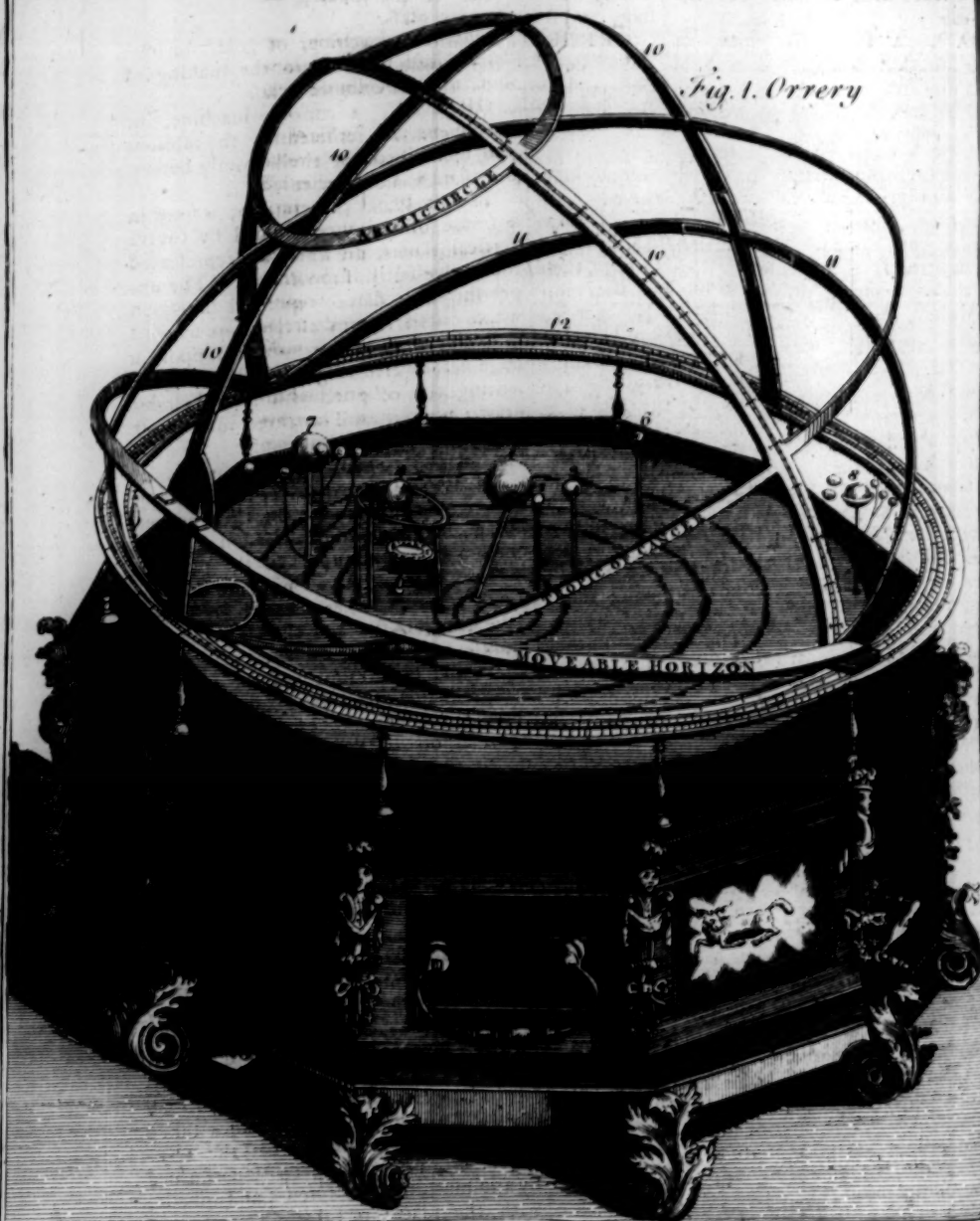
In most birds the toes are four in number, three standing forwards and one backwards. In some two toes stand forward, and two backward. Some feet, again, are palmated, or have the toes connected together by a membrane, and others semi-palmated.

With regard to the wings, the long-quill-feathers are called by authors remiges, as serving to fly with; and the other feathers, placed over the rest of the body, rectrices. The long feathers of the tail are called rectrices, as serving to steer the bird's course through the air.

As to the other terms made use of in the description of birds, they are these: *cara* expresses the membrane or naked tunic, which surrounds and extends itself over more or less of the base of the beak: *urrophigium* is the rump; and as to other terms, they will be found explained under their several heads.

OROBUS,





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OROBUS, bitter vetch, in botany, it agrees in virtues with *ervum*. See the article *Ervum*.

ORPHAN, a fatherless child, or minor; or one that is deprived both of father and mother.

* **ORPHEUS**, in fabulous history, the Son of Apollo, by the Muse Calliope, and was born in Thrace. He was so excellent a musician, that at the sound of his voice and lyre the waves stopt their course, the rocks moved, and the most savage beasts were tamed. He married Eurydice, a princess of that country, but Aristæus, a neighbouring prince, falling in love with her, she, in flying to escape his violence, was killed by the bite of a serpent. The disconsolate Orpheus descended to hell in order to recover her, when Pluto and Proserpine were so touched by his harmony, as to permit him to take back his wife, on condition that he should not look back upon her till they came to the light of the world; but his impatient fondness having made him turn his head, his dear Eurydice was taken for ever from him. From that time he disregarded the whole sex, which so enraged the Thracian women, that they tore him to pieces. After his death the Muses took care of his body, and his lyre was transported to the skies, where it forms one of the constellations.

ORPIMENT, *Auripigmentum*, in natural history, a beautiful fossile, so called from its being used as a gold coloured pigment.

Orpiment is a native fossile, found chiefly in Turkey and Natolia. Some is met with also in Bohemia, Hungary, and Lusatia near Sorau, but inferior in goodness to that of Turkey. The best sort is of a lively gold-yellow and green colour, here and there intermixed with pieces of vermilion red; of a shattery foliaceous texture, somewhat flexible, soft to the touch like talc, and sparkling when broke. The inferior kinds are of a dead yellow, inclining more to greenish; and want the sparkling appearance of the foregoing.

The principal use of orpiment is as a colouring drug, among the painters, book-binders, &c. Of itself it makes a gold coloured pigment, as hath been already observed; with indigo or other blues, green: it is commonly tempered with yolk of eggs and a little saffron, or with fish galls. At Rouen it is used for staining wood of the colour of box-wood. It is mixed also with wax, employed for

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heightening the colour of gold, for hardening lead in order to the making of shot, and for colouring glass.

ORRERY, a curious machine, or movement, for representing the motions and appearances of the heavenly bodies. See plate xxxix. fig. 1.

The orrery, or planetarium, is fixed in a frame of ebony, contained by twelve vertical planes, on which are represented the twelve signs of the zodiac. The upper surface is flat, of polished brass, on whose outward circumference are sewed in twelve brass pillars, which support a large flat silvered ring marked 12, representing the ecliptic, with several circles drawn upon it. The three innermost are divided into twelve parts for the signs of the zodiac, each of which is divided into thirty degrees, and among these degrees are graven in their proper places, the nodes, aphelia, and greatest north and south latitudes of the planets. Between the next two circles are the cardinal points. The next three circles have the months and the days of the month, according to the new stile. Upon the brass surface of the machine are graduated silver circles, which carry the planets, represented by silver balls, upon arbors or stems, that raise them up to the height of the plane of the ecliptic; and turning about the handle or winch of the orrery, all the planets move at their proportional distances from a little gilt ball in the middle, which represents the sun; and perform their revolutions according to their periodical times. There are fixed indices of blue steel, which shew the longitudes of the planets, by pointing to the divisions of the silvered rings or circles, as they move round. But as these circles, being concentric, give only the mean distances, the true orbits, according to their eccentricities, are graven on the outside of each circle, with the periodical times taken from the tables, to shew what the revolutions are, nearer than can be performed by any machine. The nodes and aphelia, with the places of greatest north and south latitudes, are also marked on those orbits. In the middle of this large circle, designed to represent the ecliptic, is fixed a globe, 1, to represent the sun. Next the sun is a small ball, 2, to represent Mercury. Next to this is Venus, 3, represented by a larger ball. And, at a greater distance from the sun, you see the earth, 4, represented by an ivory ball, surrounded at some distance by a ring,

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ring, which expresses the orbit of the moon, making an angle with the circle that represents the ecliptic, and thereby shewing the inclination they have to each other in the heavens, and also the line of the nodes. Within the same ring is another ivory-ball, 5, with a black cape or case, to represent the moon; the cap is contrived always to cover that hemisphere which is turned from the sun, and thereby distinguisheth the enlightened part from the dark side, and, consequently, her age. 6 represents Mars. 7 is Jupiter attended with his satellites, or four moons. And 8, the outmost of all the planets, is Saturn with his ring or belt, and five satellites, or moons. All these are fixed upon small stems, which severally represent their axes, each of which hath its peculiar and proper inclination to the plane of that circle which represents the ecliptic. 9 is a dial-plate; 10, 10, 10, meridians; 11, the equator; 12, the ecliptic with its circles, already described; 13, 13, two keys for locking and unlocking the diurnal and annual motions; and as to the arctic circle, tropic of Cancer, and moveable horizon, they are named in the figure.

By means of the orrery, a great many persons, who have not time to apply themselves to the study of astronomy, and yet are desirous to be acquainted with the celestial appearances, in a few days may get a competent knowledge of several phenomena, and especially, be cured of the common prejudices against the motion of the earth, and the Copernican system. See *Copernican*.

But the principal use of the orrery is to render the theory of the earth and the moon easy and intelligible; and to evidence to our senses how all those appearances happen, which depend on the annual or diurnal rotation of the earth, and the monthly revolutions of the moon: as the variety of seasons, the vicissitudes and various lengths of days and nights, the manner of solar and lunar eclipses, the various phases of the moon, &c. There have been various forms invented for this noble instrument, two of which have principally obtained, viz. the hemispherical orrery, and the whole sphere: though the orrery at first was made without any sphere, with only the sun, the earth and moon revolving about it; but as this was too imperfect a state, they soon began to invest it, some with half a sphere, and others with a whole sphere,

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to be an adequate representation of the solar system.

If we now suppose a spindle or arbor, with six wheels fixed upon it in an horizontal position, having the number of teeth in each, corresponding to the numbers in the third column, viz. the wheel A M (*fig. 2.*) of 83 teeth; B L of 52; C K of 50, for the earth, D I of 40; E H of 7, and F G of 5; and another set of wheels moving freely about an arbor, having the number of teeth in the fourth column, viz. A N of 20, B O of 32, C P of 50, for the earth, D Q of 75, E R of 83, and F S of 148; then, if those two arbors of fixed and moveable wheels are made of the size, and fixed at the distance from each other, as here represented in the scheme, the teeth of the former will take those of the latter, and turn them very freely, when the machine is in motion.

These arbors, with their wheels, are to be placed in a box, of an adequate size, in a perpendicular position: the arbor of fixed wheels to move in pivots at the top and bottom of the box; and the arbor of moveable wheels to go through the top of the box, to a proper height, on the top of which is to be placed a round ball, gilt with gold, to represent the sun. On each of the moveable wheels is to be fixed a socket, or tube, ascending above the top of the box, and having on the top a wire fixed, and bent at a proper distance into a right angle upwards, bearing on the top a small round ball, representing its proper planets.

If then on the lower part of the arbor of fixed wheels be placed a pinion of screw-teeth, a winch turning a spindle with an endless screw, playing in the teeth of the arbor, will turn it with all its wheels; and these wheels will move the others about with their planets, in their proper and respective periods of time, very exactly. For while the fixed wheel C K moves its equal C P once round, the wheel A M will move A N a little more than four times round, and so will nicely exhibit the motion of Mercury; and the wheel F G will turn the wheel F S about $\frac{1}{75}$ round, and so will truly represent the motion of Saturn: and the same is to be observed of all the rest.

ORRICE, the common name of the Iris-root. See the article *Iris*.

ORTHODOX, in church-history, an appel-



Fig. 1. Oscillation.

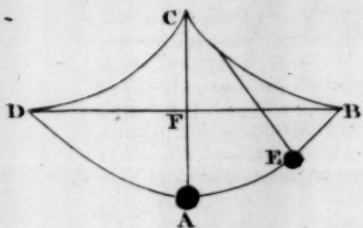


Fig. 2. Oscillation.

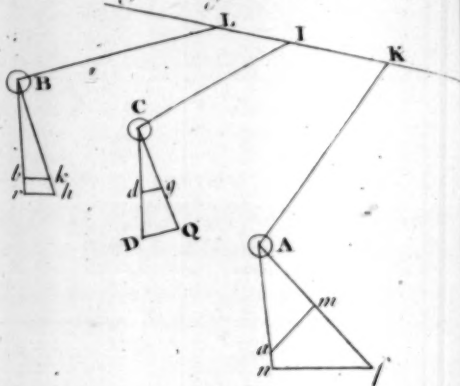


Fig. 3.

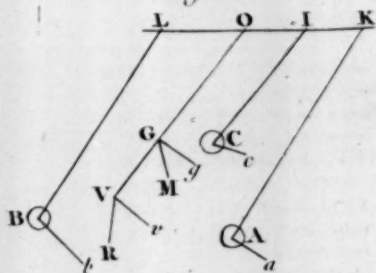


Fig. 4.

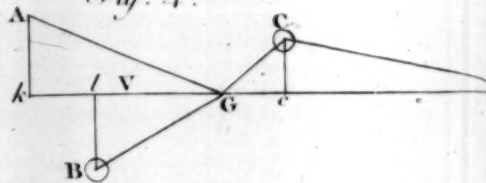


Fig. 5.

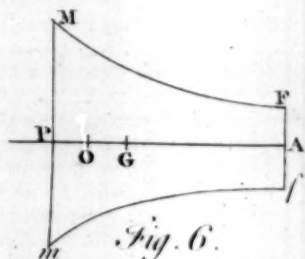
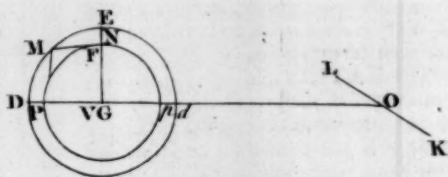


Fig. 7. Parabola.

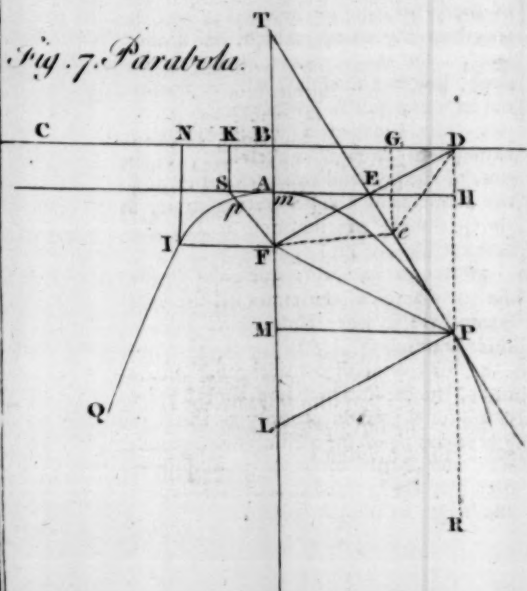
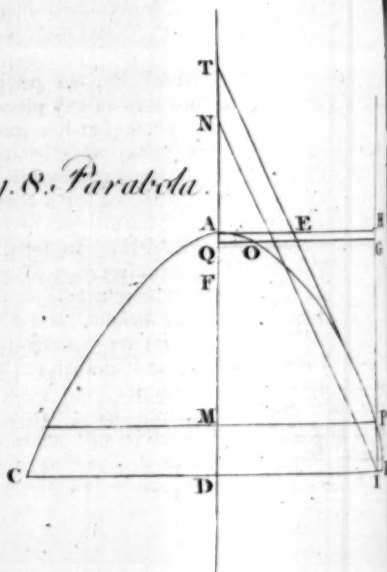


Fig. 8. Parabola.



appellation given to those who are found in all the articles of Christian faith.

ORTHOGRAPHIC Projection of the Sphere, that wherein the eye is supposed at an infinite distance; so called, because the perpendiculars from any point of the sphere will all fall in the common intersection of the sphere with the plane of the projection. See *Projection*.

ORTHOGRAPHY, that part of grammar which teaches the nature and affections of letters, and the method of spelling or writing words with all the proper and necessary letters, making one of the four greatest divisions or branches of grammar.

ORTHOGRAPHY, in geometry, the art of drawing or delineating the front plan of any object, and of expressing the heights or elevations of each part. It is called orthography, from its determining things by perpendicular lines falling on the geometrical plane.

ORTHOGRAPHY, in architecture, the elevation of a building. This orthography is either external or internal. The external orthography is taken for the delineation of an external face or front of a building; or, as it is by others defined, the model, platform, and delineation of the front of a house, that is contrived, and to be built, by the rules of geometry, according to which pattern the whole fabric is erected and finished. This delineation or platform exhibits the principal wall, with its apertures, roof, ornaments, and every thing visible to an eye placed before the building.

Internal orthography, which is also called a section, is a delineation, or draught of a building, such as it would appear, were the external wall removed.

ORTHOGRAPHY, in perspective, the front or fore view of any plane; that is, the side or plane that lies parallel to a straight line, which may be imagined to pass through the outward convex point of the eye, continued to a convenient length.

ORTHOGRAPHY, in fortification, the profile or representation of a work; or a draught so conducted, as that the length, breadth, height, and thickness of the several parts are expressed, such as they would appear if perpendicularly cut from top to bottom.

ORYZA, rice, in botany. This plant is cultivated in vast abundance in the East, as also in Carolina, for food. It is said to be good in dysenteries, diarrhoeas, &c.

OSCHEOCELE, in surgery, a hernia of the scrotum. Of this rupture, sometimes called hernia scrotalis, there are two kinds; a true one, proceeding from a prolapsion of the intestine, or omentum; and a spurious one, or only apparent, arising from a tumour of the testicles, or spermatic vessels, or a distension with air, water, or some offending humour: the oscheocele is therefore distinguished into various kinds, according to the different substances with which the scrotum is distended, by which it is also differently denominated: when the intestine is prolapsed through the process of the peritonæum into the scrotum, the tumour is then called enterocoele; if from the omentum, epiplocele; if from a distension with water, hydrocele; if from wind or flatus, pneumatocele; when from blood, hæmatocele; if the testicle is enlarged beyond its proper dimensions, it is termed sarcocoele; and when the spermatic veins are too much distended, it is termed varicocoele, cirrocele, or hernia varicosa; and when an abscess is formed in the scrotum, it is by some termed hernia humoralis: sometimes two or more of these substances concur together to form the tumour, which is then named conjunctly from them entero-epiplocele, hydro enterocoele, &c. Each of these may be seen separately treated of, under their several heads.

OSCILLATION, in mechanics, vibration, or the reciprocal ascent or descent of a pendulum.

1. If a single pendulum be suspended between two semi-cycloids BC, CD (plate XL. fig. 1.) that have the diameter CF of the generating circle equal to half the length of the string, which, as it oscillates, folds about them; all the oscillations, however unequal, will be isochronal in a non resisting medium.

2. The time of a whole oscillation through any arch of a cycloid, is to the time of the perpendicular descent through the diameter of the generating circle, as the periphery of the circle to the diameter.

3. If two pendulums describe similar arches of circles, the times of the oscillations are in the subduplicate ratio of their lengths.

4. The number of isochronal oscillations, made in the same time by two pendulums, are reciprocally as the times wherein each of the oscillations are made. The times of the oscillations, in different cycloids, are in the subduplicate ratio of the length of the pendulums.

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5. The length of a pendulum that will perform its oscillations in a second, is 3 125 inches, or three feet 3.125.

6. The shorter the oscillations in the arch of a circle are, the truer will the pendulum measure time, or the more isochronal will the oscillations be. See the article *Pendulum*.

Center of Oscillation, in a suspended body, is a certain point therein, each vibration whereof is performed in the same manner, as if that point or part alone were suspended at that distance from the point of suspension. Or it is a point, wherein, if the whole length of a compound pendulum be collected, the several oscillations will be performed in the same time as before. Its distance, therefore, from the point of suspension, is equal to the length of a single pendulum whose oscillations are isochronal with those of the compound one.

In order to determine the place of the center of oscillation in a compound pendulum, let the bodies C, A, and B, be supposed fixed to the axis at their respective distances CI, AK, and BL (plate xl. fig. 2.) and to gravitate in parallel lines CD, Aa, and Bb; let these lines be equal to each other, and represent the accelerating force of gravity; let Cg, Af, and Bb, represent the forces by which their motions are actually accelerated with their respective directions perpendicular to IC, KA, and LB, while the figure moves upon its axis KI. Let DQ, am, and bk, be perpendicular to those directions in Q, m, and k, and g d, f n, b r, be perpendicular to CD, Aa, and Bb, in d, n, and r. If CQ be greater than Cg, but Aa less than An, and Bb less than Br, then the body C loses by its action on the lever IC a force C x gQ, and thereby the bodies A and B acquire the forces A x mf and B x kb respectively. Hence regard being had to the lengths of the several levers CI, KA, and BL, according to the known principles of mechanics, C x gQ x IC will be equal to A x mf x KA + B x kb x LB, or (because the velocities Cg, Af, and Bb, are as the distances from the axis IC, AK, and BL) C x Cg x gQ = A x Af x mf + B x Bb x kb, that is C x CQ x Cg - C x Cg² = A x Af² - A x Af x Am + B x Bb² - B x Bb x Bk. But CQ x Cg is equal to CD x Cd, Af x Am to Aa x An, and Bb x Bk to Bb x Br. Therefore C x Cg² + A x Af² + B x Bb² is equal to C x C

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D x Cd + A x CD x An + B x C D x Br; from which it follows, that when all the bodies descend while the axis moves, the sum of the products of the bodies multiplied by the squares of the respective velocities acquired by them at any time, is the same as if they had fallen freely along the perpendicular altitudes from which they have descended. But if any body as B (for example) had been on the other side of the axis KL, so, as to have ascended while the common center of gravity of the bodies descended, bk had been equal to Bk + Bb. In this case the term B x CD x Br must be subtracted in the latter part of the last equation; and in general the sum of the products of the bodies multiplied by the squares of the respective velocities, is equal to the difference of the sum of the products of those that descend, multiplied by the squares of the velocities that would have been acquired by the same descents if they had fallen freely, and of the sum of the products of those that ascend, multiplied by the squares of the respective velocities that would be acquired by falling freely along the respective altitudes to which they have arisen. In either case it follows, that if the bodies be supposed to ascend from their respective places at any time, and to be retarded by their gravity only, their common center of gravity will always ascend to the same level from which it descended.

Suppose therefore OV (fig. 3.) to be equal to the length of a simple pendulum, that in a vacuum performs its vibrations in similar arcs, in the same time with the compound pendulum above described; or let OV be the distance of a point in this latter pendulum that moves in it, with the same velocity as if OV was a simple pendulum suspended at O. Let S represent the sum of the bodies C, A, and B, and OG be the distance of their center of gravity from the axis. While the pendulum moves, let the points C, B, A, G, and V, descend to c, b, a, g, and v, respectively; let GM be the perpendicular descent of the center of gravity, and VR the perpendicular descent of the point V; then because the velocities of the points C, B, A, G, and V, are as their distances from the axis of oscillation, and the velocity acquired at v is such as would cause a body to ascend from R to V (by the supposition) and the altitudes to which bodies would ascend by the velocities acquired at c, b, a, and

v , are in the duplicate ratio of these velocities, it follows that C , B , and A , would ascend by their respective velocities, at those points to the altitudes $VR \times \frac{IC^2}{OV^2}$, $VR \times \frac{LB^2}{OV^2}$, and $VR \times \frac{KA^2}{OV^2}$.

And since their common center of gravity would ascend to the same altitude from which it descended, as has been shewn

above, it follows that $C \times VR \times \frac{IC^2}{OV^2} + B \times VR \times \frac{LB^2}{OV^2} + A \times VR \times \frac{KA^2}{OV^2}$ is equal

to $S \times GM$. But the arcs described by G and V being similar, GM is to VR as OG to OV ; consequently $S \times OG \times OV$ is equal to $C \times IC^2 + B \times LB^2 + A \times KA^2$; and OV is found by multiplying each body by the square of its distance from the axis of oscillation, and dividing the sum of the products by $S \times OG$, which is the product of the sum of the bodies multiplied by the distance of their common center of gravity from the same axis. The same demonstration being applicable to any number of bodies, we may conclude, that when any body moves about a given axis, the distance of its center of oscillation from this axis (or the length of a simple pendulum that vibrates in a void in the same time with the body in similar arcs) is found by computing the fluent when each particle or element of the body is supposed to be multiplied by the square of its distance from the axis, and dividing this fluent by the product of the body multiplied by the distance of its center of gravity from the same axis.

If the points C , A , and B , (fig. 4.) be in one plane that is perpendicular to the axis of oscillation in O , let Cc , Bb , and Aa be perpendicular to OG in i , l , and k ; then OC^2 being equal to $OG^2 + CG^2 = OG^2 + OB^2 + BG^2 + CG^2 = OG^2 + BG^2 + 2OGl$, and OA^2 to $OG^2 + 2AG^2 + 2OGk$ (Elm. 12. and 13.2) the point i being betwixt O and G , and the points l and k on the other side of G ; and $C \times i \times G$, being equal to $B \times l \times G + A \times k \times G$, it follows, that the sum of the products of the bodies multiplied by the squares of their distances from O , or $S \times OG \times OV$, is equal to $S \times OG^2 + C \times CG^2 + B \times BG^2 + A \times AG^2$; consequently $S \times OG + GV$ is equal to the sum of the products, when each body is multiplied by the square of its distance from the center of gravity; and GV , the distance of the center of oscillation from the

center of gravity, is found by dividing this sum by $S \times OG$; whence the computation of the distance of the center of oscillation from the axis in solids is in some cases abridged.

To give an example, let DEd (fig. 5.) be the section of a sphere through its center G by a plane perpendicular to the axis of oscillation, Dd the diameter of this circle perpendicular to the axis, GE the radius perpendicular to Dd , and PFp any concentric circle; let MP , an ordinate perpendicular to Dd at P , meet DEd in M , MN be perpendicular to GE in N , and the ratio of n to 1 expresses that of the circumference of a circle to its radius. Let a cylindric surface be imagined to stand on the circumference PFp perpendicular to the plane DEd , and terminated by the surface of the sphere, and its altitude being $2PM$, it may be expressed by $2n \times GP \times GN$, which being multiplied by the square of GP (which is the distance of the particles in each section of this surface perpendicular to the axis of oscillation from the center of gravity of the section), and the product $2n \times GN \times GP^3$, being multiplied by the fluxion of GP , or (because GP^2 is equal to $GD^2 - GN^2$, and the fluxion of GP is to the fluxion of GN , as GN to GP) the product of $2n \times GN^2$, and $GE^2 - GN^2$, being multiplied by the fluxion of PM , and the fluent found will give $2n \times GN^3$ into $\frac{1}{3} GE^2 - \frac{1}{3} GN^2$. But this fluent becomes equal to four-fifteenths $n \times GE^3$, when P has described the whole radius DG , and GN becomes equal to GE ; and this being divided by $\frac{2}{3} n \times GE^3 \times OG$ (which expresses the solid content of the sphere multiplied by OG) gives GV the distance of the center of oscillation from the center of gravity

in the sphere equal to $\frac{2}{5} \times \frac{GE^2}{OG}$ or two fifths of a third proportional to OG and GE .

The general method of determining the center of oscillation in any plane figure, as $FfmM$, (fig. 6.) is thus. Let G be the center of gravity, and O the center of oscillation of the proposed figure when it revolves about the axis Ff , OCA perpendicular to Ff in A , and to Mm in P , $AP = x$, $Mm = y$,

$GA = z$, $OA = u$; then $z = \frac{\text{Flu. } yxx}{\text{Flu. } yx}$ and $u = \frac{\text{Flu. } yx^2 \dot{x}}{\text{Flu. } yx \dot{x}}$. Suppose $\frac{1}{2} y = x^m$,

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$$\text{then } z = \frac{\text{Flu. } x^m + 1}{\text{Flu. } x^m} = \frac{m+1}{m+2} \times x,$$

or G.A : P.A :: m + 1 : m + 2; and

$$u = \frac{\text{Flu. } x^m + 2}{\text{Flu. } x^m + 1} = \frac{m+2}{m+3} \times x, \text{ or}$$

$$O.A : P.A :: m + 2 : m + 3.$$

The center of oscillation of a sphere was just now determined from the fluent of any $xy \times aa - yy$ (supposing in the last fig. but one) the radius $GE = a$, $GN = PM = y$, $OG = x$, and n to 1, as the circumference of the circle to its radius)

which is $2ny \frac{Xaa}{3} \frac{yy}{5}$; and this flu-

ent becomes equal to $\frac{4na^5}{15}$, when $PM =$

GE , or $y = a$, which being divided by $\frac{2n}{3} \times a^3 \times x$ (the solid content of the

sphere multiplied by the distance of its center of gravity from the axis of oscillation) gives $\frac{3}{8} \times \frac{aa}{x} = u$. The center of

percussion is in a right line perpendicular to A O at the point O.

* OSIRIS, in pagan worship, the son of Jupiter and Niobe, reigned over the Argivi; but afterwards resigning his kingdom to his brother Egialeus, travelled into Egypt, of which he made himself master. He afterwards married Io, or Isis, established good laws among the Egyptians, and introduced the most useful arts, after which he was killed, and cut into pieces by his enemies, when both he and Isis were honoured as deities.

* OSNABRUG, bishoprick of, one of the states of the circle of Westphalia, governed alternately by a popish and a protestant bishop. It is bounded on the north by Lower Munster, on the south by Upper Munster, on the west by part of the country of Lingen, and on the east by the principality of Minden. When they chose a catholic bishop, it is done entirely by the catholics; but the protestant bishop must always be elected by the house of Brunswick Lunenburg. However, the inspection and administration of ecclesiastical affairs, with respect to the Roman catholics, belongs to the elector of Cologne, as metropolitan, while the protestant bishop governs in civil affairs. The chapter is composed of 25 canons. His majesty's second son is the present bishop of Osnabrug. It is

OST

40 miles in length, and 12 in breadth, and is divided into seven bailiwicks. This country abounds in cattle, and has a vast number of hogs. The only remarkable places, besides Osnabrug, are Iburg and Bellheim.

OSSICLE, *Officulum*, a little bone, a diminutive of bone; in which sense it is frequently used by anatomists.

Botanists also use officulum for the stone of a plum.

OSSIFICATION, the formation of bones, but more particularly the conversion of parts naturally soft, to the hardness and consistence of bones.

* OSTEND, a sea port town of the Austrian Netherlands. Though small, it is clean and neat, consisting of a large square market place, from whence run 8 handsome streets. The town is seated in a morass, almost surrounded by wide trenches, filled with sea-water, and is the best harbour in Flanders next to that of Sluys. In 1601 it was besieged by the Spaniards, but they could not take it till 1604. In this siege there perished by sword and sickness 50,000 men on the side of the States-General, and near 80,000 on the side of the Spaniards. The Dutch had always a free communication with the town by sea, on which account the siege lasted so long. The French took possession of it on the death of Charles II. king of Spain; it was retaken by the confederates in 1706. The French became masters of it in 1745, after the battle of Fontenoy, and it was restored to the house of Austria by the treaty of Aix-la-Chapelle. It is seated on the sea, 10 miles W. of Bruges, 22 N. E. of Dunkirk. Long. 2. 59. E. Lat. 51. 14. N.

OSTEOCOLLA, in natural history, though supposed by many to be an earth, is truly a cruisted kind of spar, debased by earth, and therefore not transparent.

Osteocolla is frequent in Germany, where it is found buried near the surface of the earth, sometimes in strata of sand, but more frequently among marls; it should be chosen for use, the purest that can be had, of a pale brown colour, and of a tolerably close and firm texture.

It has long been famous for bringing on a callus in fractured bones: its name osteocolla signifying the bone-glue, or bone-binder. It is also recommended as a diuretic, and as good in the flour albus; but, at present, little regard is paid to it; since, if it has any virtues, they

they must be wholly owing to spar, which may be given to greater advantage in a purer form.

OSTEOLOGY, that branch of anatomy which treats of the bones. The objects of osteology are the bones, whether they be recent or dried, whether they have belonged to an infant or an adult; and with the bones are to be considered their periosteum, medulla or marrow, the ligaments, and the cartilages.

The study of the bones is to be considered in two lights, as theoretical, or as practicable. In the first sense, osteology only extends to the external conformation and use of the bones; whereas, in the latter or practical sense, it comprehends the more intimate knowledge of their interior structure and connections.

1. If their internal parts are the subjects of enquiry, they are to be cut or broken.
2. If the articulations are to be examined, the ligaments and cartilages, as well as the articulations themselves, must be dissected and carefully observed.
3. If the making a skeleton be the intent, then their preparation and preservation come into this branch. See *Bone, Articulation, Ligament, Skeleton, &c.*

OSTRACITES, in natural history, the name by which authors call the fossil oyster-shells.

Ostracites has the same medicinal virtues with the belemnites, and lapis-judaius, only in a higher degree; being accounted, by Dr. Lister, one of the greatest known medicines in nephritic cases: the dose, in powder, is from half a dram to a dram, in white wine; and to prevent a sickness at the stomach, that sometimes attends the taking it, one third part of the quantity of powdered camomile flowers may be mixed with it.

OSTRICH, *Struthio*, in ornithology, a distinct genus of birds, having two toes to each foot, and these are both placed forward; and its head is simple, or not ornamented with the appendages which are common to most birds of this order. The ostrich is the tallest of all the bird kind, measuring seven or eight feet when it stands erect: its legs are very long and naked; and the structure of the foot, having only two toes, is particular.

* **OSWEGO**, *siege of*. The attack of this place was resolved on early in the spring of 1756, by the marquis de Vaudreuil, governor of Canada; and with this view he first made himself master of the adjacent country; which, it is true, was not very prudent, as it ought to have

given us the alarm; but such a contemptible opinion had the French then conceived of our conduct, that they despised any thing we should do for the defence of Oswego, or for the attack of Crown-Point, which had been resolved upon by the English officers; therefore instead of sending a reinforcement to Crown-Point, they sent all the troops they raised at Quebec and Montreal, amounting to 1300 regulars, and 1700 militia, besides Indians, up the river St. Lawrence, to Fort Frontignac, where they rendezvoused in July, and on the 29th of that month, the marquis de Montcalm, who was to have the command of this expedition, arrived there. His first care was to send out two armed vessels, one of sixteen and the other of twelve guns, to cruise off Oswego, in order to prevent the garrison's receiving any intelligence by water; and at the same time he sent a strong party of Canadians and Indians by land, with orders to post themselves on the road between Oswego and Albany, so as to intercept every courier that might attempt to pass from either of those places to the other. All the forces, and the vessels with the artillery and stores, being arrived in the bay of Nixoure, the place of general rendezvous, Montcalm ordered his advanced guard to proceed to a creek, called Anse aux Cabannes, three leagues from Oswego. The first division having arrived at that creek on the 10th of August, in the morning, the van-guard proceeded at four in the afternoon, by land, across woods, to another creek, within half a league of Oswego, in order to favour the debarkation; and at midnight the first division arrived at this creek, where they erected a battery, pointing to the lake Ontario, for the protection of their ships and vessels. The 11th and 12th were employed in making gabions, fascissons, and fascines, and in cutting a road across the woods, from the place of landing to the place where the trenches were to be opened. The second division arrived on the 12th, in the morning, with the artillery and provisions, which were immediately landed. This is the account given by the French themselves of their preparations for this important siege; and as we never had any authentic account published, we must go on with giving an account of the siege itself, which was as follows: Though dispositions were made on the 11th, for opening the trenches at night, it was midnight before we

we could begin the trench, which was rather a parallel of about a hundred toises in front, and opened at the distance of about ninety toises from the fosse of fort Ontario, in ground embarrassed with trunks of trees, &c. This parallel being finished at five in the morning, the workmen began to erect the batteries. The fire of the enemy, which had been very hot from day-break, ceased at six in the evening, and we perceived that they had evacuated the fort, and retired across the river into Oswego. Mr. Montcalm immediately took possession of Fort Ontario, and ordered the communication of the parallel to be continued to the bank of the river, where, the beginning of the night, we began a grand battery, placed in such a manner, that it could not only batter Fort Oswego, and the way from thence to Fort George, but also the intrenchments of Oswego. On the 14th a body of Canadians and savages crossed the river, some by swimming, and others by wading with the water up to their middles, in order to invest and attack the fort on the side of the woods. This bold action, by which the communication between the two forts was cut off, the celerity with which the works were carried on, in ground that the enemy thought impracticable, and the fire of a battery of nine guns, forced the enemy to hang out a white flag. By virtue of the capitulation, the garrison surrendered prisoners of war, and we immediately took possession of Oswego and Fort St. George, which we entirely destroyed, agreeably to our orders, after removing the artillery, warlike stores, and provisions. There were at Oswego seven armed ships, viz. one of eighteen guns, one of fourteen, one of ten, one of eight, and three others mounted with swivels, besides two hundred batteaux of different sizes, the officers and crews of all which were included in the capitulation. The enemy had 152 men killed and wounded; colonel Mercer, the commander, was of the number of the former. On our side we had only one engineer, one Canadian, one soldier, and one gunner killed, and twenty slightly wounded. We made 1600 prisoners, including eighty officers; these were Shirley's and Pepperell's regiments, and a part of Schuyler's regiment of militia. We found in the forts 123 pieces of artillery, fifty-five of which were cannon of different bore, and fourteen mortars, with a great quantity of ammunition and provi-

sion. We wish we could with any public authority say, that this account of our loss at Oswego was as false and extravagant as the French accounts of their military exploits usually are; but if we judge from what they say of the number of prisoners, we must conclude that the French of Canada have not yet got therodomontading humour of their countrymen in Europe; for in November a French frigate, called the *Renommée*, arrived at Plymouth from Quebec, with 184 officers and soldiers of the garrison of Oswego on board, to be exchanged for French prisoners here, besides what had been exchanged or redeemed in America, where, it seems, we had neither money nor prisoners to give in exchange for the whole number; and beside some that were sent prisoners to France, and not exchanged till the year following. But though no account of this affair was published here by authority, we shall add some things from an account of this siege, given by an officer who was one of those made prisoners at this place. This gentleman tells us, that the enemy had employed in this siege 1500 regulars, 3000 Canadians and Indians, and 1000 battoe-men, thirty-eight pieces of cannon, and several mortars. That our people were, on the 13th, obliged to desert Fort Ontario, because its works were not cannon-proof; but that they fired away all their shells and ammunition, and spiked up their cannon, before they left it. That the fort they retired to was so much exposed, that the enemy could, from Fort Ontario, see the buckles of their shoes, colonel Mercer, their governor, having been killed the very next day in the morning, by a cannon-shot, as he was directing the replacing of two of their cannon that had been dismounted; and that by these means they found themselves, the 14th, under the hard necessity to accept of the following capitulation. Art. I. The garrison shall surrender prisoners of war, and shall be conducted from hence to Montreal, where they shall be treated with humanity, and every one agreeable to their respective ranks, and according to the custom of war. II. Officers, soldiers, and individuals shall have their baggage and cloaths, and they shall be allowed to carry them with them. III. They shall remain prisoners of war until they are exchanged. To these articles the gentleman adds as follows: We imagined ourselves secure as to our persons and baggage, but, to our

our great surprize, we were soon convinced to the contrary. No sooner had we delivered up our arms, than both officers and soldiers were ordered to the parade; there we stood, to be insulted by the enemy Indians, who, not satisfied with taking away our baggage, murdered several of our soldiers as they stood on the parade, and scalped all our sick in the hospital; they cut lieutenant de la Court to pieces, as he lay in his tent, after having his wound dressed, though delivered into the care of a French officer; and many of us narrowly escaped to the other side of the water with our lives, and even there we expected to be all massacred, as the Indians made several efforts to get into the fort to scalp us. A number of colonel Schuyler's regiment, about twenty or twenty-two, were delivered up to the Indians, by the marquis de Montcalm's orders, in lieu, as he said, of the same number of Indians we had killed; though it was expressed in the capitulation, that both officers and soldiers should be secured from any insults. Colonel Schuyler demanded them at Quebec, but never received any satisfaction; and in all probability it was too late, as the Indians, doubtless, gratified their insatiable revenge on several of them, to atone for the blood of their brethren. The marquis acted cunningly in not suffering any of his British majesty's soldiers to be given up, as he well knew it would not be put up with: so the lot fell on the poor Provincials. Thus the French keep treaties, and articles of capitulation. The officers of the three regiments were next day put on board twenty batteaux for Montreal; and August the 19th, about five in the morning, we arrived at Montreal, where we saw the shore lined with a great number of Indians. Lieutenant-colonel Littlehales, being commanding officer, slept first on shore, and was immediately seized by a number of these savages, who buffeted him, knocked him down, and would have killed him, but were prevented by some regulars, sent down by the governor's orders to guard us up. We were drove about, and used extremely ill, till we got into the place; the Indians, like so many hell-hounds, were, as they said, eager for revenge; but in a little time we were sent under a guard to different quarters in the town, and in a day or two came aboard, and were never used ill after by the Indians. It is a custom among them to buffet prisoners on their

arrival, and our Mohawks use their prisoners in the same manner. Thus we have given the best account we could collect of our loss of Oswega. And from this account can we suppose that any military skill was employed in erecting what we called the forts there? Can we suppose that any common sense directed us to post such a number of men, and to lay up such magazines of provisions and military stores, at such an untenable place, where the enemy could so easily come with a superior force, and provided with artillery, and every thing necessary for a siege, and where our garrison, after being invested, could expect no relief? From such a conduct could we expect success in any of our warlike operations?

OSYRIS, poets rosemary, in botany. This whole shrub is astringent, and consequently good in fluxes.

Osyris is also a name sometimes used for the linaria, or toad-flax.

OTHONNA, bastard jacobaea, in botany, a genus of plants.

OTIS, the bustard, in ornithology, makes a distinct genus of birds, the characters of which are these: there are three toes on each foot, all turned forwards; and the head is naked, or has no comb. The bustard has been confounded with the turkey: it is about the size of the common peacock, and runs at a great rate, being frequently taken with greyhounds in a fair course, in the manner of hunting the hare: its flesh is well tasted.

OTTER, *Lutra*, in zoology, a genus of quadrupeds, the characters of which are these: the fore-teeth in the upper jaw are straight, distinct, and acute; those of the under jaw are obtuse, and stand close together: the ears are situated lower than the eyes, and the feet are furnished each with five toes, and are palmated, or formed for swimming. Of this genus there are two species: 1. The common otter, with all the toes of an equal length: this is a very fierce animal, three feet in length, including the tail. 2. The Brazilian otter, with the inner toe shorter than the rest. This is somewhat larger than the former species.

* OTWAY, THOMAS, a celebrated tragic poet, was the son of Mr. Humphry Otway, rector of Wolberding in Sussex, and was born at Trotton in that county, the 3d of March 1651. He was educated at Oxford, when leaving the university without a degree, he retired to London, where he applied himself to poetry, and commenced player, in which he did not

much

much succeed. However, the sprightliness of his conversation gained him the favour of Charles Fitz-Charles, earl of Plymouth, who procured him a cornet's commission in a new-raised regiment sent into Flanders; but he returned from thence in necessitous circumstances, and applied himself again to writing. He was naturally extravagant and profuse, and could not live one year in a comfortable competence, but was either rioting in luxury, or pining away with want, and exposed to the insolence and contempt of the world. He had powerful enemies, at the head of whom was Dryden; and though he had the art of moving the passions in a very great degree, he was several times unsuccessful in his dramatic pieces. In short, after suffering many eclipses of fortune, and being exposed to the most cruel necessities, he died of want in a public house on Tower-hill, the 14th of April 1685, in the 33d year of his age. It has been reported, that delicacy having long deterred him from borrowing small sums, he was at length driven to the most grievous necessity of venturing out of his lurking place, when, naked and shivering, he went into a coffee-house on Tower-hill, where seeing a gentleman of whom he had some knowledge, he begged of him to lend him a shilling. The gentleman was shocked to see the author of Venice preserved begging bread, and being filled with compassion, put a guinea into his hand. Mr. Otway thanked his benefactor, instantly retired, and changed the guinea to purchase a roll; but as his stomach was full of wind by excess of fasting, the first mouthful choked him, and instantly put a period to his life. He wrote nine dramatic pieces, the most admired of which are the Orphan, and Venice preserved. He also wrote several poems.

OVAL, an oblong curvilinear figure, with two unequal diameters, intersecting each other at right angles in the center; or a figure bounded by a single curve line imperfectly round, its length being greater than its breadth, like an egg; whence its name. The proper oval, or egg-shape, is an irregular figure, being narrower at one end than the other; in which it differs from the ellipsis, which is the mathematical oval, and equal in breadth at each end. These two are confounded together by the common people, and even geometers call the oval a false ellipsis.

OVARY, *Ovarium*, in anatomy, that

part of a female animal wherein the ova or eggs are formed and lodged.

OVATION, in the Roman antiquity, a lesser triumph, allowed to commanders for victories won without the effusion of much blood, or for defeating a mean and inconsiderable enemy. The show generally began at the Albanian mountain, whence the general, with his retinue, made his entry into the city on foot, with many flutes or pipes sounding in concert as he passed along, and wearing a garland of myrtle as a token of peace. The term ovation, according to Servius, is derived from *ovis*, sheep, because on this occasion the conqueror sacrificed a sheep, as in a triumph he sacrificed a bull.

OVEN, a kind of domestic furnace, used for baking bread, pies, tarts, &c. of a circular structure, with a very low roof, well lined, both on the top, bottom, and sides, with stone; it has a small entrance in the front, which is exactly fitted by a kind of door, which being clapped to the mouth of the oven confines the heat, while bread, pies, or puddings, are baking. Over this pastry-cooks, &c. have another oven built much in the same manner, which is used for such things as require a less degree of heat. Ovens are heated by burning dry woods, faggots, &c. in them, till all the parts are equally hot.

Assaying **OVEN**, in metallurgy, a particular kind of furnace, used by assayers in their operations upon metals.

OVER-RULING an Objection, in law, the rejecting or setting it aside by the court.

OVERSEERS of the Poor, public officers appointed by statute in every parish, to provide for the poor therein.

OVERT, the same with open: thus an overt-act signifies an act which, in law, must be clearly proved; and such is to be alledged in every indictment for high treason.

OVID, or **PUBLIUS OVIDIUS NASO**, a celebrated Latin poet, and one of the finest geniuses of the Augustan age, was a Roman knight, born at Sulmo, in the 43d year before the Christian era. He had from his infancy an extraordinary fondness for writing verses. He studied rhetoric under Aurelius Fuscus, and for some time frequented the bar; but was afterwards disgusted at that study, and applied himself entirely to poetry. Ovid, after having obtained the esteem of Augustus, incurred his displeasure, and was banished to Tomos, a city

on the Pontus Euxinus, near the mouth of the Danube, when he was fifty years of age. Several writers have said, that he was sent into banishment for being one of the lovers of Julia, the daughter of Augustus. Ovid himself says, that his being sent into exile was occasioned by the licentiousness of his verses, and his having seen, by accident, and involuntarily, something that he ought not to have seen. He in vain endeavoured to be restored to favour. He died in the country of the Getæ, in the year 17, aged 57, after having spent seven years in banishment. His poems, which are still extant, are, 1. His *Metamorphoses*. 2. His *Fasts*. 3. *De Tristibus*. 4. *De Ponto*. 5. *Epistole*. 6. *De Arte Amandi*. There are discoverable in Ovid's poems great wit, and an easy, soft, natural, and luxuriant style. He is a perfect master of the passions, but he is sometimes too negligent and profuse, and almost always too licentious. He particularly excelled in elegies.

OVIPAROUS, a term applied to such animals as bring forth their young *ab ovo*, from eggs; as birds, insects, &c. The oviparous kind stand in opposition to those which bring forth their young alive, called viviparous animals, as man, quadrupeds, &c. Oviparous animals may be said to be such as conceive eggs which they afterwards bring forth, and from which, by the incubation of the parent, or some other principle of warmth and fermentation, at length arise animals; which, after they have spent the moisture or humour they have been surrounded withal, and are grown to a sufficient bulk, firmness, and strength, break their shell and come forth. The oviparous kind, besides birds, include divers other species of terrestrial animals.

OUNCE, *Uncia*, a small weight, the sixteenth part of a pound avoirdupois, and the twelfth part of a pound troy: the ounce avoirdupois is divided into eight drams, and the ounce troy into twenty penny-weights.

OUNCE, *Lynx*, in zoology.

OVULO, or **OVUM**, in architecture, a round moulding, whose profile or sweep, in the Ionic and Composite capitals, is usually a quadrant of a circle; whence it is also commonly called the quarter round. It was usually enriched with sculpture by the ancients, in the form of chestnut-shells; whence Vitruvius, and others, called it *echinus*, i. e. chestnut-shell.

VOL. III.

OUSTER LE MER, in law, signifies a cause of excuse given to the court; on a defendant's not appearing upon summons, by alledging that he was then beyond the seas.

OUT-HOUSES, such as belong and are adjoining to dwelling-houses.

OUT-LAW, one that is deprived of the benefit of the law, and therefore held to be out of the king's protection.

OUT-LAWRY, is where a person is out-lawed, and on that account loses the benefit of a subject.

OUTWORKS, in fortification, those works made without side the ditch of a fortified place, to cover and defend it. Outworks, called also advanced and detached works, are those which not only serve to cover the body of the place, but also to keep the enemy at a distance, and prevent his taking advantage of the cavities and elevations usually found in the places about the counterscarp, which might serve them either as lodgments, or as *rideaux*, to facilitate the carrying on the trenches, and planting their batteries against the place: such are ravelines, tenailles, hornworks, *quève d'arondes*, envelopes, crown-works, &c.

It is a general rule in all outworks, that if there be several of them, one before another, to cover one and the same tenaille of a place, the nearest ones must gradually, one after another, command those that are farther advanced out into the champaign, that is, must have higher ramparts, that so they may overlook and fire upon the besiegers, when they are masters of the more outward works.

OVUM PHILOSOPHICUM, or **CHYMICUM**, a glass-body, of an oval form resembling an egg, used for the sublimation or mercury.

OWSE, among tanners, *oaken bark* beaten or ground small, to serve in the preparation of leather.

OX, *Bos*, in zoology makes a genus of quadrupeds.

Oxen like other domestic animals, vary in colour, though the dun seems the most common; and the redder it is, the more it is esteemed. A black coat is also valued; and bay oxen are said to be vigorous and long lived; whereas the brown soon decay. The grey, the dappled, and the white, are proper only for the slaughter; no care can render them fit for labour; but whatever be the colour of an ox's coat, it should be glossy, thick, and smooth to the touch; for if it be harsh, rough, or thin, there is reason to

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suppose that the animal is out of order, or at least not of a strong constitution. A good ox for the plough must be neither too fat nor too lean; the head short and thick; the ears large and shaggy; the horns strong, glossy, and of a middling size; the forehead wide, the eyes full and black; his muzzle large and flat; the nostrils wide and open; the teeth white and even; the lips black; a fleshy neck, large and heavy shoulders; the breast broad; the dew-lap hanging down to the knees; the reins very broad; a spacious descending belly; the flanks firm; the haunches large, and the rump thick; large and nervous thighs and legs; the back straight and full; the tail reaching to the ground, and well covered with thick and fine hair; the feet firm; the hide thick and pliable; the muscles raised; the hoof short and broad: he must also answer to the goad, be obedient to the voice, and well trained; but it is only gradually, and by beginning early, that the ox can be brought willingly to bear the yoke, and be easily governed. At the age of two years and a half, or three at the latest, you must begin to tame him, and bring him under subjection; if delayed longer, he becomes froward, and often ungovernable. The only method of succeeding is, by patience, mildness, and even caresses; for compulsion and ill-treatment will only disgust him irreclaimably; stroking him gently along the back, clapping him, given him occasionally boiled barley, ground beans, and such other aliments as please him best, all of them mingled with salt, of which he is very fond, will prove of the greatest use. At the same time his horns should be often tied, and some days after the yoke is to be put on his neck, and fastened to a plough, with another ox of the same size ready trained; these are to be tied together at the manger, and in the same manner led to the pasture, that they may become acquainted, and accustomed to have one common motion. The goad is never to be made use of in the beginning, as that would only render him more untractable; he must also be indulged, and labour only at short intervals; for till he is thoroughly trained, he tires himself very much; and for the same reason he is to be fed more plentifully than at other times. An ox should draw the plough only from his third to his tenth year, when it will be advisable to fatten and sell him as being then of a better flesh than if he was kept longer.

The age of this creature is known by his teeth and horns. The first fore-teeth, which he sheds at the end of ten months, are replaced by others; larger, but not so white; at six months the teeth next to those in the middle fall out, and are also re-placed by others; and in three years all the incisive teeth are renewed. They are then equal, long, and pretty white; but as the ox advances in years, they wear, become unequal and black. It is the same in the bull and cow; so that the growth and shedding of teeth are not affected by castration, or the difference of sexes. Nor is the shedding of the horns affected by either; as both bull, ox, and cow, lose theirs alike at the end of three years; and these also are re-placed by other horns, which, like the second teeth, remain; only those of the ox and cow are larger and longer than those of the bull. The manner of the growth of these second horns is not uniform, nor the shooting of them equal. The first year, that is the fourth year of the ox's age, two small pointed horns make their appearance, nearly formed, smooth, and towards the head terminated by a kind of button. The following year this button moves from the head, being impelled by a corneous cylinder, which also lengthening, is terminated by another button, and so on; for the horns continue growing as long as the creature lives. These buttons become annular joints, which are easily distinguished in the horn; and by which the age of the creature may be readily known: counting three years for the point of the horn to the first joint, and one year for each of the other intervals.

* OXFORD, a city of Oxfordshire, and the seat of the most noble university in the world. It is said to have been the seat of the Muses, even in the time of the ancient Britons, and that Alfred the Great, after the Danish storms were blown over, restored it to its former use, and built three colleges. Oxford was made a bishop's see by Henry VIII. and St. Fridieswide's church was turned into a cathedral, by the name of Christ-church, and he endowed it with the land belonging to the late monasteries of Abingdon and Osney. Besides the cathedral, here are thirteen parish churches. As a corporation, it consists of a mayor, high-steward, four aldermen, eight assistants, a recorder, two chamberlains, a town-clerk, and twenty-four common-council-men. The mayor in his jurisdiction

diction is subordinate to the vice-chancellor of the university for the time being. This city sends two members to parliament. The university contains twenty colleges and five halls, many of which are magnificent structures, as are also the Theatre, Dr. Radcliffe's Library, Ashmole's Museum, &c. The magistrates of the university are the chancellor, high-steward, vice-chancellor, and proctors. The first is chosen for life, by the students themselves in convocation. The high-steward is nominated by the chancellor, and approved by the university; and his office is also for life. The vice-chancellor, who is always the head of some college, and in holy orders, is elected yearly in convocation. The proctors are two masters of arts, chosen yearly, by turns, out of the several colleges, to keep the peace, to take up disorderly persons, and to oversee the weights and measures, that the students may not be imposed on. This city is 68 miles E. by N. of Bristol, 80 W. S. W. of Cambridge, 58 N. E. of Salisbury, and 58 W. N. W. of London. Oxford is seated on an eminence, and the whole town, with the suburbs, is of a circular form, and about three miles in circumference, consisting chiefly of two spacious streets crossing each other at the middle of the town; and as several of the colleges stand in the streets, from thence it receives a greater air of magnificence. The river is navigable from hence to London, and sends great quantities of malt and corn thither by barges. It has two markets, on Wednesdays and Saturdays; and three fairs, held on May 3, September 1, and Thursday before Michaelmas, for toys and small ware. Long. 1. 15. W. Lat. 51. 45 N.

* OXFORDSHIRE, a county of England, bounded by Buckinghamshire on the E. Berkshire on the S. Gloucestershire on the W. and the counties of Northampton and Warwick on the N. It is about 38 miles in length from N. to S. and 25 in breadth from E. to W. the circumference being 130 miles. The principal rivers are the Tame and the Isis, that run through the county: besides which, there are the Cherwell, the Windrush, the Evenlode, the Sarbrook, the Glyn, the Oke, the Stour, and other lesser streams. It is said to contain 534000 acres of land, 14 hundreds, 280 parishes, and 12 market-towns. It sends ten members to parliament; two for the city of Oxford, two for the university,

two for Banbury, two for Woodstock, and two for the county. In general, this county yields plenty of corn and pastures, besides plenty of game. The air is sweet, pleasant, and mild.

OXGANG, or OXGATE, is generally taken in our old law-books, for fifteen acres, or as much ground as a single ox can plough in a year.

OXYCRATE, *Oxycratum*, in pharmacy, &c. a mixture of vinegar and water, proper to alluage, cool, and refresh: they make fomentations of oxycrate, clysters of oxycrate, &c. The usual proportion is one spoonful of vinegar to five or six spoonfuls of water.

OXYCROCEUM, in pharmacy, &c. a preparation much used in plasters for fractures, &c. made as follows: take yellow wax, one pound; pitch and galbanum, each half a pound; melt them over a gentle fire; and then add of Venice-turpentine, myrrh, and oilibanum, each three ounces; saffron, two ounces: make them into a plaster.

OXYMEL, in pharmacy, a composition of honey and vinegar, boiled to the consistence of syrup.

OYER, in law-books, seems to have been anciently used for what is now called assizes.

OYER AND TERMINER, a commission directed to the judge of assize, and other gentlemen, empowering them to hear and determine all criminal causes, and to try all offenders.

OYER of a Deed, a petition to hear and peruse any deed, upon which an action is brought. This is always granted the defendant, who may also take a copy of it, that he may consider what to plead to the action.

OYES, or OYEZ, signifies *bear*; and is frequently used by the cryers in courts, on making proclamation, or to enjoin silence.

OYSTER, or OISTER, *Ostrea*, in zoology, a genus of bivalve shell-fish, the lower valve of which is hollowed on the inside, and gibbous without; the upper one is more flat; and both are composed of a multitude of laminae or crusts, and usually scabrous or rough on the outer surface: some oyster-shells are also furnished with tubercles, or spines, and others are deeply furrowed and plicated: the figure of most is roundish, but in some it is quite irregular.

Oyster-shells are accounted drying and abstergent; and given internally, sudorific.

O Z E

OZENA, a foul malignant ulcer of the nose, which is sometimes so exulcerated as to discharge a fetid odor, with pieces of corrupted bones. An ozena is generally more violent and foul when attended with a caries of the bones; for, at first, the internal coat of the nose only is ulcerated, but it extends itself insensibly into the slender bones, and often into the sinuses of the cranium, and the ossa maxillaria, and excites a malignant caries. It generally arises from an obstinate catarrh or some other disorder of the nose, especially when the blood is affected with the scurvy, or venereal disease; but sometimes from acrid substances drawn into the nose with the air, and corroding its membrane, as strong sternutatory powders, and sometimes it proceeds from, or is joined by a polypus. The signs of an ozena are discoverable from what has been already mentioned;

O Z E

but, for the event, the cure is certainly difficult, because the bones, especially the ossa spongiosa are surprisingly tender, and not sufficiently exposed to view; in consequence of which, the part affected cannot be properly cleansed. For this reason the disorder spreads, and at length corrodes the septum, and other bones of the nose in such a manner, that the external part is deformed, and the faculties of speech and respiration injured. Some have thought an ozena a sufficient plea for a divorce. The cure must be performed not only by external, but also by internal medicines, to correct the blood, as antivenereals, of which mercurials and decoctions of the woods are the principal. The patient likewise must be ordered to use a diet moderate and light, neither strong nor light seasoned. When the case is venereal, salivation is the best remedy.

P.

P P

P, A consonant, and the fifteenth letter in the English alphabet; when followed by an *b* in the same word, it sounds like an *f*, as in Philip, phrase, &c.

The **P** is not sounded in psalms, Ptolemy, pseudo, &c. nor the *ph* in phthisic.

P, in the Italian music, denotes piano, soft; that is, the force of the voice or instrument is to be diminished, so as to make a kind of echo. *p p*, piu piano, that is, more soft; and *p p p*, pianissimo, softest of all, or a third echo, the voice being almost lost in the air.

P M, in astronomy, denotes post meridiem or afternoon; sometimes post mane, after morning, that is, after midnight.

P, in medicine, denotes pugil, or the eighth part of a handful.

P. Æ. in medicine, *partes æquales*, equal parts, the same with *a* or *ana*.

P P, in medicine, *pulvis patrum*, the Jesuit's bark in powder, so called as they

were the first who brought it into Europe.

PACE, *Passus*, a measure taken from the space between the two feet of a man in walking; usually reckoned two feet and a half, and in some men a yard, or three feet. The geometrical pace is five feet; and 60,000 such paces make one degree of the equator.

PACE, in the manage, is of three kinds, viz. walk, trot, and gallop; to which may be added an amble, because some horses have it naturally.

PACK, in commerce, a quantity of goods, made up in loads, or bales, for carriage.

A pack of wool is seventeen stone and two pounds, or a horse's load.

PACOS, in zoology, a species of Peruvian camel, without any gibbosity, erroneously reckoned by some a sheep: it is only three feet and a half high, from the ground to the top of the back; but the neck is very long, so that when the head is carried erect it is pretty tall.

PACK,

P A D

PACK, or **PACTION**, *Paſſum* in law. a contract, or agreement, between two or more parties.

PACTA CONVENTA, in Poland, the articles agreed on between the king and the republic, which they mutually oblige each other to observe.

PADDOCK, or **PADDOCK COURSE**, a piece of ground encompassed with pales or a wall, and taken out of a park for exhibiting races with grey-hounds, for plates, wagers, or the like.

PADUA, a large, ancient, and celebrated city of Italy, with an university, and a bishop's see. it is also capital of the Paduano, but is not so considerable as it was formerly, for it now contains no more than 30,000 inhabitants, whereas it formerly had 100,000, and many of the houses are gone to ruin: however, the hall where justice is administered, is a superb structure. The cathedral church, and the college of the university, are in that part called the Old Town; and there are piazzas under all the houses, where persons may walk without being exposed to the weather. The garden of the university is curious, on account of the number of plants. Here a student may take his degrees, let him be of what sect of Christianity he will; nay, though he should be a Jew or a Turk. The patron of this city is St. Anthony, who lies in the cathedral; they have such a veneration for him, that the beggars do not ask charity in the name of God, but for the love of St. Anthony. The Jews live in a distinct part of the city, and the neighbouring mountains produce excellent wine and oil, with delicious fruits. It was taken by the Venetians in 1706. It is seated on the Brenta and Bachiglione, in a fine plain, and is about seven miles in circumference, twenty south-east of Vicenza, and 22½ north of Rome. Long. 12. 20. E. Lat. 45. 24. N.

PADUS, the laurel, or birds cherry in botany, a genus of plants.

PÆAN, among the ancient pagans, a song of rejoicing sung in honour of Apollo, chiefly used on occasions of victory and triumph.

PÆDARTHROCAES, in surgery, a discale of the bones, raising them into tumors near the joints, and differing from the spina ventosa, not being attended either with violent pains, or erosions of the bone and adjacent parts. The bones of children, being softer than those of adults, are therefore the more easily diffended by humours, and more frequently

P A G

raised into tumors: these are hard in this case, and the adjacent soft parts are not inflamed and are free from redness, inflammation, and pain. It is, however, to be observed, that this disorder, though at first very different from the spina ventosa, is sometimes known to degenerate into that disorder. *Heister's Surgery.*

PÆDO-BAPTISM, infant-baptism, or that conferred on children.

PEONIA, male and female peony, or piony. They are both found wild in some parts of Europe, and cultivated with us in gardens: they are perennial, produce their flowers in May, and very soon shed them. The male peony has been generally preferred for medicinal use; but the female, which is the largest and most elegant, and for this reason the most common, is the species which the shops have been principally supplied with. In quality, there does not appear to be any material difference betwixt the two; and hence the college allow both sorts to be taken indiscriminately.

PAGAN, *Paganus*, a heathen, gentile, or idolater; one who adores false gods.

PAGANALIA, certain festivals observed by the ancient Romans in the month of January. They were instituted by Servius Tullius, who appointed a certain number of villages (*pagi*). In each of which an altar was to be raised for annual sacrifices to their tutelary gods; at which all the inhabitants were to assist, and give presents in money, according to their sex and age, by which means the number of country-people was known. The servants upon this occasion offered cakes to Ceres and Tellus, to obtain plentiful harvests.

PAGANISM, the religious worship and discipline of pagans; or, the adoration of idols and false gods. The gods of paganism were either men, as Jupiter, Hercules, Bacchus, &c. or fictitious persons, as Victory, Fame, Fever, &c. or beasts, as in Egypt, Crocodiles, Cats, &c. or finally, inanimate things, as Onions, Fire, Water, &c.

PAGE, a youth of state retained in the family of a prince or great personage, as an honourable servant, to attend in visits of ceremony, do messages, bear up trains, robes, &c. and at the same time to have a genteel education, and learn his exercises. The pages in the king's household are various, and have various offices assigned them, as pages of honour,

nour, pages of the presence-chamber, pages of the back-stairs, &c.

PAGEANT, a triumphal car, chariot, arch, or other like pompous decoration; variously adorned with colours, flags, &c. carried about in public shews, processions, &c.

PAGOD, or PAGODA, a name whereby the East Indians call the temple in which they worship their gods. The pagod usually consists of three parts, the first is a vaulted roof supported on stone or marble-columns. It is adorned with images, and, being open, all persons without distinction are allowed to enter it; the second part is filled with grotesque and monstrous figures, and nobody is allowed to enter it but the brahmins themselves: the third is a kind of chancel, in which the statue of the deity is placed: it is shut up with a very strong gate. This word is sometimes used for the idol, as well as for the temple.

PAGOD, or PAGODA, the name of a gold and silver coin, current in several parts of the East Indies.

PAIN, Dolor, an uneasy sensation arising from a sudden and violent solution of the continuity, or some other accident in the nerves, membranes, vessels, muscles, &c. of the body; or, according to some, it consists in a motion of the organs of sense; and, according to others, it is an emotion of the soul occasioned by these organs. There are various kinds of pain, one is attended with pulsation, another with a sense of incumbent weight, another with a tension; there is a pain which attends erosion, incision, puncture, and perforation, comprehended with these and the like differences under the name acute; and, lastly, there is a pain attended with a torpor and numbness. Besides the above-mentioned, there are other distinctions of pain: thus some pains are fixed, others moveable and wandering, as it often happens in a redundancy of humours; some pains are continual, and others intermittent; some intense, others remiss; some again afflict the patient in the beginning of the disease, others afterwards; and sometimes they arise on the critical day, sometimes not; and to mention no more, some pains are seated in the external parts, others in the internal; some in the noble, others in the ignoble parts.

PAIN FORT ET DURE, in law, signifies a particular punishment inflicted on a person who being arraigned for felony, refuses to put himself upon the

common trial of God and his country, but instead thereof obstinately stands mute: this punishment is vulgarly called pressing to death. By a late act of parliament, those who stand mute are to be holden as guilty, and convicted of the crimes with which they are charged.

PAINTING, *Pictura*, the art of representing figures, countries, towns, and other things in colours. Painting is doubtless ancient as well as sculpture, but it is hard to know the real time and place where they began to appear. The Egyptians and Greeks, says Rollin, who pretend to be the inventors of those arts which are most for the splendor of life, pretend that they were the first carvers and painters; however it is certain that painting, after having some weak beginnings, appeared in its perfection among the Greeks, and that the principal schools, where this art was taught, were at Sicione, a town of Peloponnesus, at Rhodes, and Athens: from Greece it passed into Italy, where it was in great esteem about the end of the republic, and under the first emperors, until at last, war and luxury having dismembered the Roman empire, it became extinct, as well as other sciences and arts, and did not begin to revive again, till the famous Cimabue laboured at it, and recovered from the hands of certain Greeks, some slender remains of this art. Some Florentines, having seconded him, were those that gained most reputation, yet it was long before any considerable painting was produced. Le Ghirlandais, Michael Angelo's master, acquired the most credit; but Michael Angelo, his scholar, in the time of pope Julius II. at the beginning of the fifteenth century, eclipsed the glory of all that went before him, and erected a school at Florence. Peter Perugin and Raphael de Urbin, who excelled him very much, and even Michael Angelo himself, formed a school at Rome, consisting of several excellent painters; at the same time the school of Lombardy was set up, and was famous under Giorgione and Titian, who had Julian Bellino for his master; besides which, there were also in Italy some other particular schools, under different masters; amongst the rest, that of Leonardo de Vinci at Milan, but the three first are esteemed the most famous, the rest having proceeded from them; but over and above these, there were on this side the mountains some painters who had nothing to do with those of Italy, as Albert Durer

Durer in Germany, Holbens in Switzerland, Lucas in Holland, and several others that wrought in France and Flanders, in a different manner; but Italy, and Rome especially, was the place where this art was practised in its greatest perfection, and where from time to time were brought up excellent painters. The school of Raphael was succeeded by that of Carraccio, which hath almost lasted till now in its height and perfection; but at present there is little of it in Italy, this art seeming to have passed into France, since Lewis XIV. hath set up academies for those that practise it. We have said before, that the first invention of this art of painting is not certainly known; but it is agreed, that he who first attempted drawing, made his first essay upon a wall, by drawing the shadow of a man, which the light discovered; and to give the greater beauty to this story, some write that it was a girl who thus designed the face of her lover. Some alledge that it was one Philocles, of Egypt, who first reduced this invention into practice; others name Cleanthes of Corinth, and others again say, that Ardices a Corinthian, and Telephanes, of Clarentia, in Peloponnesus, began to draw without colours, with a coal only; and that the first who made use of one colour in painting, was one Cleophantes of Corinth, and for that reason called Monochromatos: after him, it is said that Higienontes, Dinias, and Charmas, were the first that drew pictures in one colour only. Eumarus of Athens, at last, painted both men and women in a different manner; his disciple, Simon, the Cleonian, began to paint the body in various postures, and to represent the joints and limbs, the veins, and the foldings of the drapery; however, it is certain, that in the time of Romulus, and about the fifteenth Olympiad, that is, 715 years before Christ's incarnation, Candaules, surnamed Myrsilus, king of Lydia, bought, for its weight in gold, a picture of Bularchus's painting, in which was represented the battle of the Magnesians. Panæus, the brother of Phidias, was in esteem in the eighty-third Olympiad, 448 years before our Saviour: Polygnotus, the Thasian, was the first that put thought and passion into the face, and gave force and beauty to the colours; he did several things at Delphos and Athens. At the same time Mycon made himself famous, also, in Greece. About the ninetieth Olympiad appeared

Aglaophon, Cephissodotes, Phirillus, and Evener, the father of Parrhasius; all these painters were excellent in the art, but Apollodorus exceeded them all; he lived in the ninety-third Olympiad, 408 years before the birth of our Lord; his manner was imitated by Zeuxis, Parrhasius, the great Apelles, and several others, till the reign of Augustus. It is not known what painters have wrought in Italy since the reign of this emperor. When the Constantines and Theodosius took upon them the protection of the church, these Christian emperors caused some carving and painting works to be made for the ornaments of the churches, but we have almost nothing considerable of the remains of those pieces. It is probable, one reason of the decay of painting was occasioned by the second council of Nice's decreeing religious worship to be paid to the images of our Saviour and the saints: this practice being looked on by a great part of the church as a dangerous and unwarrantable innovation, several of the Greek emperors made a vigorous opposition against it; and the better to suppress these excesses, ordered the images, &c. to be taken out of the churches and defaced; and by this means the art itself fell under a great discouragement. But, after the year 1270, the famous Cimabue restored the art of painting, which was perfected by the painters of the succeeding age. About the beginning of the fifteenth century, there were famous painters in the Low-Countries, and in Germany. Rollin.

Cleaning Pictures and PAINTINGS.—

The art of cleaning pictures and paintings, though of great consequence to the preserving valuable works of that kind, has been very little understood even by those who profess to practise it; on which account many valuable pictures have been damaged: and indeed few escape without damage, in a greater or less degree, which come under the hands of those who pretend to make it their business; and yet most generally know no other than one single way of treating all the subjects they are to operate upon, however different may be the condition or circumstances of them. As a painting may be, however, souled with a variety of different kinds of matter, many of which will not be dissolved, or suffer their texture to be destroyed by the same substances, it is necessary to know what will dissolve or corrode each kind; for these

there is no other means of removing, or taking off any foulness, than by dissolving or corroding by some proper menstruum, the matter which constitutes it, except by actual violence, which the tender nature of oil paintings by no means suffer them to bear. Of these substances, which will remove, by dissolving or corroding it, the matter which may foul paintings, some are very apt likewise to act upon and dissolve the oil in the painting itself; and consequently to disorder or bring off the colours; while others are, on the contrary, passive and innocent, with respect to the painting; and may be used freely, or indeed in any quantity whatever, without the least inconvenience of this kind. As paintings to be cleaned are likewise varnished with a variety of substances of different natures, which sometimes require to be taken off, and at other times are much better left remaining, it is very necessary to be able to judge what is best to be done in this point; as likewise to know the means by which each sort of varnish may be taken off without injury to the painting: for in fact, without this there is no way of cleaning pictures, in some circumstances, but by scouring till, as well the surface of the picture as the foulness be cleared away. We shall therefore first give some account of the nature of the substances which are, or may be, used for cleaning paintings. In oil, as it regards this application of them: and then shew how they may be used, as well for the taking off the varnish, as the removing any foulness that may be either upon or under it.

The first and most general substance used for cleaning pictures is water. This will remove many kinds of glutinous bodies, and foulness arising from them; such as sugar, honey, glue, and many others, and also take off any varnish of gum-arabic, glair of eggs, and isinglass; and is therefore the greatest instrument in this work. It may be used without any caution, with regard to the colours, as it will not in the least affect the oil which holds them together.

Olive oil, or butter, though not applied to this purpose, through an ignorance of their efficacy, will remove many of those spots or foulness which resist even soap; as they will dissolve or corrode pitch, rosin, and other bodies of a like kind, that otherwise require spirit of wine, and oil of turpentine, which endanger the painting: and they may be

used very freely, not having the least effect on the oil of the painting.

Wood-ashes, or what will better answer the purpose, when used in a proper proportion, pearl-ashes, being melted in water, make a proper dissolvent for most kinds of matter which foul paintings; but they must be used with great discretion, as they will touch or corrode the oil of the painting, if there be no varnish of the gum-resins over it, so as to render the colours liable to be injured by very little rubbing. The use of them, or soap, is, however, in many cases unavoidable, and in general they are the only substances employed for this purpose.

Soap is nearly of the same nature with the last-mentioned substances; being indeed only oil incorporated with salts of the same kinds, rendered more powerfully dissolvent by means of quick-lime: for which reason it is something more efficacious; but consequently more hazardous, as it will the sooner get hold of the oil of the paintings. It should, therefore, not be used but on particular spots, that elude all other methods, and there with great caution.

Spirit of wine, as it will dissolve all the gums, and gum-resins, except gum-arabic, is very necessary for the taking off from pictures varnishes composed of such substances, but it corrodes also the oils of the paintings, and softens them in such a manner, as makes all rubbing dangerous while they are under its influence.

Oil of turpentine will likewise dissolve some of the gums used for varnish; but spirit of wine will in general much better answer that purpose. There are, however, sometimes spots of foulness, which will give way to spirit of turpentine, that resist most other substances used in this intention; and it may, therefore, be tried where they appear to fail, but very sparingly, and with great caution, as it will very soon act even on the dry oil of the painting.

Essence of lemons has the same powers as oil of turpentine; but is, moreover, a much stronger dissolvent, and should therefore only be used in desperate cases, where spots seem indelible with regard to all other methods. Spirit of lavender and rosemary, and other essential oils, have the same dissolving qualities as essence of lemons; but they are in general dearer, and some of them too powerful to be trusted near the colours.

Whenever

Whenever paintings are varnished with gum-arabic, glair of eggs, or isinglass, the varnish should be taken off when they are to be cleaned. This may be easily distinguished by wetting any part of the painting, which will feel clammy, if varnished with any substance dissolvable in water. In such cases, the taking off the varnish will frequently alone render the painting entirely clean; for if it has been laid on thick, and covered the surface every where, the foulness must necessarily lie upon it. The manner of taking off this kind of varnish must be done by means of hot-water and a sponge, the picture, or painting being laid horizontally. The water may be nearly boiling hot, and may be used copiously at first with the sponge; but when the varnish appears to be softened, and the painting more naked, it should be used cooler; and, if the varnish adhere, so as not to be easily brought off by a sponge, a gentle rubbing with a linen cloth may be used; the cloth being frequently wrung, and wet again with fresh water a little warmish.

When paintings appear, by the above trial, to be varnished with the gum-resins, or such substances as cannot be dissolved in water, it is proper, nevertheless, to wash them well with water pretty warm, by means of a sponge, which will sometimes be alone sufficient to clean them, even in this case: but if there yet appear any foulness, rub the painting over with olive-oil made warm, or butter; and if any parts appear sneary, or any foulness seem to mix with the oil or butter, pursue the rubbing gently, taking off the foul oil, and adding fresh till all such foulness be wholly removed. Let the oil be then wiped off with a woollen cloth, and if the picture require further cleaning, the wood-ashes, or pearl-ashes, must be used in the following manner; which, indeed, as to the first part, is not widely different from the method commonly used.

“Take an ounce of pearl-ashes, and dissolve them in a pint of water; or take two pounds of wood-ashes, and add to them three quarts of water, and stir them well in the water once or twice in an hour, for half a day; and then, when the earthy part of the ashes has subsided, pour off the clear fluid; and evaporate it to a quart; or if it appears acrid to the taste at that time, three pints may be left. Wash, by means of a sponge, the painting well with either of these

solutions, or lyes, which are in fact the same thing, made warm; and rub any particular spots of foulness gently with a linen cloth till they disappear: but if they appear to remain unchanged by the lye, do not endeavour to take them off by mere force of rubbing; for that would infallibly damage the colours under the spots, before they could be removed: but in this case they should be left to be tried by the spirit of wine, or the essential oils of turpentine and lemons. Where thick spots seem to give way in part, but yet resist in a degree to this lye, a little strong soap-suds may, in some cases, be used, with great caution; but it should be prevented as much as possible from touching any part of the painting, except the spot itself; and as that disappears, the soap-suds should be diluted with water, that it may not reach the oil of the colours in its full strength. If, however, all this be done upon a strong coat of varnish, there will be less hazard; and, in such cases, the washing freely with the wood-ash lye, or weak soap-suds, will frequently do the business effectually, without any material damage: but it requires some judgment to know where paintings may be freely treated; and, with respect to those of great value, it is always best to proceed by more circumspect methods, and to try the more secure means we have above directed, before these rougher be used.”

Some use the wood-ashes, with the addition of water only, without separating the solution of the salts from the earth; which, when so used, assists in scrubbing the foulness from the painting; but all such practices are to be condemned; as the finer touches of the painting are always damaged in a greater or less degree, where any abrading force is employed in cleaning it.

Where spots appear, after the use of all the above-mentioned methods, spirit of wine, or if that fail, oil of turpentine, and in the further case of its default, essence of lemons must be applied. The spots should be lightly moistened with them, avoiding to suffer them to touch any more of the surface than what is covered with the foulness; and the part should be immediately rubbed with a linen cloth, but very gently; observing at the same time to desist, if the colours appear the least affected. After a little olive oil should be put on the spot, where oil of turpentine and essence of lemons are used, and water where spirit

of wine is applied: which being taken off by a woollen cloth, if the foulness be not wholly removed, but appears to give way, the operation must be repeated till it be entirely obliterated.

Where paintings appear to have been varnished with those substances that will not dissolve in water, and after the careful use of the above means the foulness still continues, or where, as is very often found, the turbidness, or want of transparency, or the yellow colour of the varnish, deprave the painting so as to destroy its value, such varnish must be taken off; the doing of which, though attended with the greatest difficulty to those who proceed by the methods now in use, and which indeed is seldom done by them at all, but with the destruction of the more delicate tints and touches of the painting, is yet very easily and safely practicable by the following method:

"Place the picture or painting in an horizontal situation, and moisten, or rather flood, by means of a sponge, the surface with very strong rectified spirit of wine; but all rubbing, more than what is necessary to spread the spirit over the whole surface, must be avoided. Keep the painting thus moistened, by adding fresh quantities of the spirit for some minutes; then flood the whole surface copiously with cold water; with which, likewise, the spirit, and such part of the varnish as it has dissolved, may be washed off. But in this state of it, all rubbing, and the slightest violence on the surface of the painting, would be very detrimental. When the painting is dry, this operation must be repeated at discretion, till the whole of the varnish be taken off."

In pictures and paintings which have been long varnished, it will be found sometimes that the varnish has been a composition of linseed-oil, or some other substantial oil, with gums and resins. If such paintings cannot be brought to a tolerable state by any of the above-mentioned means, which may in this case be freely used, the mischief may be deemed to be without remedy. For it is absolutely impracticable to take off such varnish, as it is more compact and indissoluble than the oil of the painting itself; and could only be wrought upon by those menstrua and dissolvents, which would act more forcibly on the paintings: such pictures must, therefore, be left in the state they are in, except by being freed from any foulness that may be

upon this varnish, and may be cleaned away by the methods we have before directed. The coat of this varnish may indeed be sometimes made thinner, by anointing the surface of the painting with essence of lemons; and then putting on olive-oil, which, when rubbed off by a soft woollen-cloth, will carry away the essence with such part of the varnish as it may have dissolved; but this requires great nicety, and can never be practised without some hazard of disordering the colours of the painting.

Method of taking off PAINTINGS in Oil, from the Cloths or Wood on which they were originally done; and transferring them entire, and without Damage, to new Pieces. The art of removing paintings in oil from the cloth or wood on which they are originally done, and transferring them to new grounds of either kind of substance, is of very great use; as not only pictures may be preserved, where the canvas is so decayed and damaged, that they would otherwise fall to pieces; but paintings on ceilings or wainscot, which, when taken away from the places where they were originally placed, would have little value, may be conveyed to cloths; and by being thus brought to the state of other pictures, become of equal worth with those painted originally on canvas. The manner in which this is done, is by cementing the face of the picture to a new cloth, by means of such a substance as can afterwards be dissolved, and consequently taken off by water; destroying the texture of the old cloth, by means of a proper corroding fluid; and then separating the corroded parts of it entirely from the painting: after which, a new cloth being cemented to the reverse of the painting in its place, the cloth cemented to the front is in like manner to be corroded, and separated; and the cemented matter cleansed away by dissolving it with water, and rubbing it off from the face of the picture. The particular method of doing this, with most convenience, is as follows.

Let the decayed picture be cleansed from all grease that may be on its surface; which may be done by rubbing it very gently with crumbs of stale bread; and then wiping it with a very fine soft linen cloth. It must then be laid, with the face downwards, on a smooth table covered with fan paper, or the India paper; and the cloth on the reverse must be well soaked with boiling water, spread upon it by means of a sponge, till it appears

pears perfectly soft and pliable. The picture is then to be turned with the face upwards; and, being stretched in the most even and flat manner on the table, must be pinned down to it in that state, by nails driven in through the edge, at proper distances from each other. A quantity of glue should be then melted, and strained through a flannel cloth, to prevent any gravel, or other impurities, from lurking in it; and when it is a little stiffened, a part of it should be spread on a linen cloth, of the size of the painting, where it should be suffered to set and dry; and then another coat put over it: when this is become stiff also, the glue should be again heated; and while it remains of such heat as to be easily spread, it should be laid over the face of the picture, and a linen cloth immediately put over it in the most even manner, and nailed down to the picture and table at the edge likewise. The glue should not be used boiling-hot, as that would hazard some of the more delicate colours of the painting; and the linen cloth should be fine and half worn, that it may be the softer, and lie the flatter on the surface of the picture: in order to which, it is proper to heat it till the glue be soft and pliable before it be laid on, and to compress each part gently with a ball, formed of a linen rag tied round with thread. The table, with the picture, cloth, &c. nailed down to it in this state, should be then exposed to the heat of the sun, in a place where it may be secured from rain, and there continued till the glue be perfectly dry and hard; at which time the nails should be drawn, and the picture and linen cloth taken off from the table. The picture must now be again turned with the face downwards, and stretched and nailed to the table as before; and a border of wax must be raised round the edge, forming as it were a shallow trough with the surface of the picture, into which trough should be poured a proper corroding fluid, to eat and destroy the threads of the original canvas or cloth of the picture. The corroding fluid used for this purpose may be either oil of vitriol, aquafortis, or spirit of salt; but the last is preferable, as it will more effectually destroy the thread, when it is so weakened by the admixture of water, as not to have any effect on the oil of the painting; which ever is used, it is necessary they should be properly diluted with water: to find the due proportion of which, it is expedient to make some

previous trials; and when they are found to be of such strength as to destroy the texture of thread without discolouring it, they are in the due state. When the corroding fluid has done its office, a passage must be made through the border of wax at one end of it; and the fluid must be poured off, by inclining the table in the requisite manner; and the remaining part must be washed away, by putting repeated quantities of fresh water upon the cloth. The threads of the cloth must then be carefully picked out till the whole be taken away; but if any part be found to adhere, all kind of violence, even in the least degree, must be avoided in removing them; instead of which, they should be again touched, by means of a pencil, with a corrosive fluid less diluted than before, till they will readily come off from the paint. The reverse surface of the painting being thus wholly freed from the old cloth, must be then well washed with water, by means of a sponge, till the corroding fluid employed be thoroughly cleansed away; when being wiped with a soft sponge, till all the moisture that may be collected by that means be taken off, it must be left till it be perfectly dry. In the mean time a new painting, which now remains cemented to the linen cloth, put on the surface of it; and the reverse of the painting being dry, and spread over by some hot glue, purified as before, and melted with a little brandy or spirit of wine, the new canvas must be laid on it, in the most even manner, while the glue yet remains hot, and settled to it by compression; which may be performed by thick plates of lead, or flat pieces of polished marble. Great care should, however, be taken in the laying them on, to prevent the edge from cutting or bruising the paint; as also, during the setting of the glue, to take them off; and wipe them at proper intervals, to prevent their adhering to the cloth by means of the glue, which may be pressed through it. The lead or marble, by which the compression is made, being removed when the glue is set, the cloth must be kept in the same state till the glue be perfectly dry and hard; and then the whole must be again turned with the other side upwards, and the border of wax being replaced, the linen cloth, on the face of the painting, must be destroyed by means of the corroding fluid, in the same manner as the canvas was before; but greater care must be taken with respect to the

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strength of the corroding matter, and in the picking out the threads of the cloth; because the face of the painting is defended only by the coat of glue which cemented the linen cloth to it. The painting must then be freed from the glue, by washing it with hot water, spread and rubbed on the surface by a sponge; which should be cleansed frequently during the operation, by dipping and squeezing it in clean water. The painting may afterwards be varnished as a new picture; and if the operation be well conducted, it will be transferred to the new cloth in a perfect state.

When the painting is originally on wood, it must be first detached from the ceiling or wainscot, where it was fixed, and the surface of it covered with a linen cloth, cemented to it by means of glue, in the manner before directed for the paintings on canvas. A proper table being then provided, and overspread with a blanket, or thinner woollen cloth, if laid several doubles, the painting must be laid upon it with the face downwards, and fixed steady; and the boards or wood on which it was done must be planed away, till the shell remain as thin as it can be made, without damaging the paint under it. The proceedings must afterwards be the same as was before practised in the case of the paintings on canvas, till that on the wood be in like manner transferred to a cloth or canvas.

The whole of the above operation must be managed with the greatest care, otherwise the painting will receive some damage: and so much nicety is required in the corrosion, and taking off the threads of the cloth, that it can scarcely be performed rightly, but by such as have had some experience in the matter. It is proper, therefore, for any person who would practise it in the case of valuable paintings, to try it first with some old pictures of little value, till they find they have the right method of proceeding: and even then, in some instances, where the coats of paint lie very thin on the cloth, it is scarcely practicable without miscarriage. But, as in the case of pictures greatly decayed, or paintings on wood taken from buildings that do not admit of being commodiously replaced elsewhere, there can be no great loss, if a failure should happen; and a considerable advantage may accrue, if the experiment succeed; for which there is good chance, if the operation be properly con-

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ducted, and the subject favourable; it is very well worth while to make the trial.

PAIR, *Par*, two equal or similar things joined together either collectively, as a pair of gloves, or two similar parts that compose one whole, or a set of things joined to make another complete, &c.

PAIR, in anatomy, an assemblage of two nerves, having their origin in the brain or spinal marrow, and thence distributed into the several parts of the body; one on one side, and the other on the other.

PALACE, *Palatium*, a name generally given to the dwelling houses of kings, princes, bishops, and other great personages; and taking different epithets, according to the quality of the inhabitants, as imperial palace, royal palace, pontifical palace, cardinal palace, ducal palace, episcopal palace, &c.

PALÆSTRA, in Grecian antiquity, a public building, where the youth exercised themselves in wrestling, running, playing at quoits, &c.

PALANQUIN, a kind of chaise, or chair, borne by men on their shoulders, much used by the people of China, and the East, as a vehicle for their easy conveyance from place to place.

PALATE, *Palatum*, in anatomy, the flesh that composes the roof, or the upper or inner part of the mouth.

Wounds of the palate, and other parts of the mouth, are only to be healed by being anointed with honey of roses, either alone, or mixed with balsam of Peru, or with oil of myrrh per deliquium.

* **PALATINATE**, a considerable province of Germany, divided into Upper and Lower. The Upper Palatinate, is likewise called the Palatinate of Bavaria; and the Lower Palatinate, is an electorate. It is about 100 miles in length, and 70 in breadth, and the principal rivers are the Rhine and the Neckar, besides several other smaller streams. It is not a very rich country, though there are very fine vineyards, fertile fields, hand-some forests, good gardens, and the rivers and lakes abound in fish; besides, there are cattle, game, and wild fowl; however, there are neither mines nor salt-works. In general, the Lower Palatinate has suffered more by the preceding wars with France, than all the provinces of Germany put together; for the French have plundered the country, and demolished some of its fine towns more than

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than once. The Papists, Calvinists and Lutherans have an equal right of toleration in this country. This Palatinate consists of 13 bailiwicks. These are all comprehended in the circle of the Lower Rhine; but on the eastern side of that river the elector possesses the principality of Simern and the bailiwick of Kreutznach and Kirckburg. The revenue of the elector is almost 300,000 l. a year.

PALE, *Palus*, a little pointed stake or piece of wood, used in making inclosures, separations, &c.

PALE, in heraldry, one of the honourable ordinaries of an escutcheon; being the representation of a pale or stake placed upright, and comprehending the whole height of the coat from the top of the chief to the point.

PALED FLOWERS, in botany, those which have their leaves set about, or surrounding, an head, or thrum, as in matigolds, &c.

PALES, in pagan worship, the goddess of the shepherds, to whom they offered milk and honey, in order to induce her to deliver them and their flocks from wild beasts and infectious diseases. This goddess is represented as an old woman.

PALILIA, a feast among the ancient Romans, in honour of the goddess Pales.

The palilia were celebrated with great festivity by the shepherds on the first of May, to beseech that goddess to take care of their flocks, and preserve them from wolves and diseases. Part of the ceremony consisted in burning heaps of straw, and jumping over them.

PALING, a sort of fencing for fruit-trees planted in fields, wherein three small posts are erected at a foot and a half distance one from another, and near the top nailed to each other with cross-bars.

PALISADE, or **PALISADO**, in fortification, an inclosure of stakes or piles driven into the ground, each six or seven inches square, and eight feet long, three whereof are hid under ground. Palisades are generally used to fortify the avenues of open forts, gorges, half-moons, the bottoms of ditches, the parapets of covert-ways, and in general all posts liable to surprize, and to which the access is easy. Palisades are usually planted perpendicularly, though some make an angle inclining towards the ground next the enemy, that the ropes cast over to tear them up may slip.

Turning **PALISADES** is an invention

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of M. Coehorn, in order to preserve the palisades of the parapet of the covert-way from the besiegers shot. He orders them so, that as many of them as stand in the length of a rod, or in about ten feet, turn up and down like traps, so as not to be in sight of the enemy, till they just bring on their attack, and yet are always ready to do the proper service of palisades.

PALISADE, in gardening, a sort of ornament; being a row of trees which bear branches and leaves from the bottom, cut and spread in manner of a wall along the side of an alley, or the like, so as to appear like a wall covered with leaves.

PALL, in heraldry, a kind of cross representing the pallium, or archiepiscopal ornament sent from Rome to the metropolitans.

PALLADIUM, in antiquity, a statue of the goddess Pallas, supposed to have dropped down from heaven, preserved in Troy, whereon the fate of that city is said to have depended.

PALLET, among painters, a little oval piece of wood, &c. very thin and smooth; on which they place the colours they have occasion for, ready for the pencil; it has a hole at one end to put the thumb through, to hold it.

PALLET, among potters, crucible makers, &c. a wooden instrument, almost the only one they use, for forming, beating, and rounding their works.

PALLEL, in gilding, an instrument made of a squirrel's tail, to take up the gold leaves from the pillow, and to apply and extend them on the matter to be gilt.

PALLET, in heraldry, is nothing but a small pale, consisting of one half of it in breadth; and therefore there are sometimes several of them upon one shield.

PALLET, a part belonging to the hallance of a watch or movement. See *Watch*.

PALLIATION, or a **PALLIATIVE CURE**, in medicine, is when, in desperate and incurable diseases, after predicting the fatal event, the physician prescribes some remedies for mitigating the pain, or some other urgent symptoms, as in ulcerated cancers, or cancerous fistulas, and the like.

PALLIUM, or **PALL**, an archiepiscopal vestment of whitewoolen cloth, about the breadth of a border, made round, and thrown over the shoulders. Upon

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Upon this border there are two others of the same matter and form, one of which falls down upon the breast, and the other upon the back, each having a red cross upon it: several crosses of the same colour being likewise upon the upper part of it, about the shoulders.

PALM, *Palma*, in anatomy, the inside of the hand, called also vola.

PALM is also a measure of length, the same as hand-breadth.

PALM-SUNDAY, in the Christian church, the Sunday next before Easter; so called in memory of our Saviour's triumphal entry into Jerusalem, when the multitude that attended him strewed palm branches in his way.

PALMARIS MUSCULUS, one of the flexor muscles of the hand, so called as being inserted into the palm of the hand by a broad expanded tendon: its office seems to be the constriction of the palm.

* **PALMYRA**, formerly a very magnificent city of Syria, now part of Turkey in Asia, was the capital of the territories of queen Zenobia. There are very magnificent ruins still remaining; of which there are excellent draughts made on the spot. None of the inscriptions are earlier than the birth of Christ, and none later than the destruction of the city by Aurelian, except one, which mentions Dioclesian. It was probably first looked upon as an advantageous spot for carrying on the trade of India, and preserving an intercourse between the Mediterranean and the Red Sea; for which reason its trade flourished long before the birth of Christ, from whence we may see the cause of its wealth. As it lay between Egypt, Persia, and Greece, it partook of the manners of each nation; imitating the Egyptians in their funeral rites, the Persians in their luxury, and the Greeks in their buildings. Among the ruins of Palmyra there are a few huts of the Arabs, and about 30 in the court of the great temple. It is 130 miles S. E. of Aleppo, and about 100 from the river Euphrates. Long. 39. 5. E. Lat. 34. 40. N.

PALPABLE, that which is perceivable by the senses, particularly that of feeling.

PALPEBRÆ, the eye-lids, in anatomy. See *Eye*.

PALPITATION, in medicine, a spastic contraction of the heart, when it leaps and beats violently.

PALSY, *παράλυσις*, in medicine, a disease wherein the body, or some of its

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members, lose their motion, and sometimes their sensation or feeling. The apoplexy, says Dr. Mead, when not mortal, frequently terminates in a palsy, which is the crisis of the disease: this palsy generally seizes but one side of the body; and what Morgagni observes, after Valsalva, that, on dissection of the bodies of apoplectics, who had been seized with a hemiplegia, he always found the cause of the disease in the opposite side of the brain, the doctor says he has formerly found true more than once in St. Thomas's hospital. There is now no longer any room for blood-letting or drastic purges; it will be sufficient to give warm and moderate cathartics now and then, such as the tinctura sacra. And as the disease is now become chronic, instead of blisters, it will be requisite to make issues in proper places, especially in the nape of the neck, and above the scapulae, either with the actual cautery, or with caustic medicines. Hippocrates advises to apply the actual cautery in eight places, at least, and specifies them.

The cure is to be chiefly prosecuted with aromatic strengtheners and steel; and besides, it is of service to stimulate the skin of the paralytic part; which is extremely well effected by the green ointment, mixed with the seventh or eighth part of the strong spirit of vitriol; and when the part begins to be rubified, the liniment is to be removed, and the part anointed with ointment of elder. Cold bathing is very beneficial in persons not too far advanced in years, but hot bathing is prejudicial to all paralytics; some of whom the doctor has known sent to Bath by a mistaken notion of their physicians, who, upon coming out of the bath, were seized with a return of the apoplexy, which carried them off.

Wherefore the doctor makes the following remarks on these waters. Their chief virtue seems to consist in a certain mineral heat, whereby they warm and cherish the stomach and intestines; and, therefore, they are chiefly serviceable to those who have ruined their appetite and digestive faculty by drinking wine or other spirituous liquors, which is well known to be the cause of a number of evils; but they are very prejudicial to all whose inward parts, as the brain, lungs, liver, or kidneys, are too hot. And, for the same reason, though they may be agreeable to, and mend the stomach, yet, if the use of them be continued too long,

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long, they more frequently hurt this organ: that very warmth which was beneficial at first, by immoderate perseverance, becoming prejudicial, by over-relaxing the fibres. A circumstance which the doctor several times observed, more particularly in patients whose diseases were owing to a fault in the nervous fluid.

This disease never is acute, is often tedious, and in old people almost incurable; and the patient for the most part drags a miserable life. For the vigour of his mind, together with his memory, are lost, or vastly impaired; he totters and shakes, and becomes a dismal sight, as if no longer a man, but an animal half dead.

PALUMBUS, the ring-dove, a beautiful species of pigeon, with the neck white on each side, and a brown spot behind.

* **PAN**, in pagan worship, the son of Mercury and Penelope, the wife of Ulysses, who was ravished by Mercury in the form of a white goat, while she was keeping her father's flocks. He was no sooner born, than his father carried him to heaven in a goat's skin, where he charmed the celestial assembly with his pipe, after which he was educated on mount Menelaus in Arcadia, by Sinoe, and the other nymphs, whom he attracted by his music. He afterwards distinguished himself in the war with the giants, when he entangled Typhon in his nets. He attended Bacchus in his Indian expedition. He had a contest with Cupid, but was conquered by the little deity, who punished him by inspiring him with a passion for the nymph Syrinx, who treated him with disdain; but he closely pursuing her, overtook her by the river Ladon, when invoking the naiades, she was changed into a tuft of reeds, which the disappointed lover grasped in his arms: but observing that as they trembled with the wind they formed a murmuring sound, he made of them the pipe for which he became so famous. He charmed Luna, in the shape of a beautiful ram, and had several other amours. He is represented with a smiling ruddy face, a thick beard, with the horns, legs, feet, and tail of a goat, with a shepherd's crook in one hand, and his pipe of unequal reeds in the other. He is also crowned with the leaves of the pine, and clothed with a spotted skin. He was properly the god of shepherds and hunters, and the flocks and herds were under his immediate protection. Orpheus re-

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presents this deity as signifying universal nature. He was particularly honoured in Arcadia. The Romans adopted him amongst their deities under the names of Lupercus and Lyncus.

PANACEA, among physicians, an universal medicine, or a remedy for all diseases; a thing impossible to be obtained, according to no less an author than Boerhaave.

PANADA, a diet consisting of bread boild in water to the consistence of a pulp, and sweetened with a little sugar. It is given to young children and sick persons, whose digestion is weak, or where stronger foods would be improper. It is sometimes made thin, to serve as a drink.

PANAX, ginseng, in botany. See *Ginseng*.

PANCREAS, in anatomy, is a long flat gland, of that kind which anatomists call conglomerate, situated under the stomach, between the liver and spleen.

PANDECTS, in the civil law, collections made by Justinian's order, of five hundred and thirty-four decisions of the ancient lawyers, on so many questions occurring in the civil law; to which that emperor gave the force and authority of law, by an epistle prefixed to them. The pandects consist of fifty books, and make the first part of the body of the civil law.

* **PANDORA**, in fabulous history, a woman formed by Prometheus, to whom each of the deities bestowed some perfection. Venus gave her beauty; Pallas, wisdom; Juno, riches; Apollo, music; and Mercury, eloquence: but Jupiter being displeased at Prometheus for having stolen fire from heaven to animate the mass he had formed, gave Pandora a box, charging her not to open it, and then sent her to the earth with this box, in which were inclosed age, diseases, pestilence, war, famine, envy, discord, and all the evils and vices that could afflict mankind. This fatal box was opened by Epimetheus, Prometheus's brother, when instantly all the diseases and mischiefs with which it was filled spread over the heart, and hope alone remained at the bottom. This story was probably considered by the pagans as no more than an allegory, to shew the consequence of disobedience in things apparently indifferent.

PANEGYRIC, an oration in praise of some extraordinary thing, person, or virtue. Panegyric is ranked among the demonstrative

monstrative kinds of orations, of which there are commonly reckoned two kinds, viz. the artificial, where every thing is reduced to certain heads; and the other natural, where the order of history is observed.

PANEL, in law, a schedule, or small roll of parchment, in which is contained the names of the jurors returned by the sheriff, to pass upon trial; so that the impannelling of a jury is no more than the sheriff's entering them upon his panel or roll.

PANIC, an ill-grounded terror or fright.

PANICUM, panic, in botany, a genus of plants. Panic seed is accounted drying, refrigerant, and astringent; and therefore recommended in spitting of blood, and nocturnal pollutions.

PANNEL, in joinery, a tympanum, or square piece of thin wood, sometimes carved, framed, or grooved in a larger piece, between two upright pieces and two cross pieces.

PANNELS of a Saddle, two cushions or bolsters, filled with cow's or horse-hair, and placed under the saddle, on each side, to prevent the bows and bands from galling the horse.

PANNICULUS CARNOSUS, in comparative anatomy, a robust fleshy tunic, situated in beasts, between the tunic and the fat; by means of which they can move their skin in whole or part: it is altogether wanting in mankind.

PANTHEON, in Roman antiquity, a temple of a circular form, dedicated to all the gods: it was built by Agrippa, son-in-law to Augustus; but is now converted into a church, and dedicated to the Virgin and all the martyrs.

PANTOMIME, one who imitates all sorts of actions and characters, by mere gestures, without speaking a word.

PAPAYER, the poppy, in botany. See **POPPY**.

PAPER, *ὑμῶν*, sheets of a thin matter, made of some vegetable substance. The materials on which mankind have, in different ages, contrived to write their sentiments, have been extremely various; in the early ages they made use of stones, and tables of wood, wax, ivory, &c. See *Book*.

Egyptian paper was made of the rush papyrus; bark paper, of the inner rind of several trees; cotton paper, of cotton; incombustible paper; and European paper, of linen rags.—Egyptian paper was principally used among the ancients, being made of the papyrus, or *bitulus*, a species of rush which grew on

the banks of the Nile. In making it into paper, they began with lopping off the two extremes of the plant, the head and the root; the remaining part, which was the stem, they cut lengthwise into two nearly equal parts, and from each of these they stripped the scaly pellicles of these which it consisted. The innermost of these pellicles were looked on as the best, and that nearest the rind as the worst: they were therefore kept apart, and made to constitute two different sorts of paper. As the pellicles were taken off, they extended them on a table, laying them over each other transversely, so as that the fibres made right angles; in this state they were glued together by the muddy waters of the Nile; or, when those were not to be had, with paste made of the finest wheat-flour, mixed with hot water and a sprinkling of vinegar. The pellicles were next pressed, to get out the water, then dried, and lastly flattened and smoothed by beating them with a mallet: this was the Egyptian paper, which was sometimes farther polished by rubbing it with a glass-ball, or the like. Bark-paper was only the inner whitish rind between the bark and the wood of several trees, as the maple, plane, beech, and elm, but especially the tilia or linden-tree, which was that mostly used for this purpose. On this, stripped off, flattened, and dried, the ancients wrote books, several of which are said to be still extant.—Chinese paper is of various kinds; some is made of the rinds or barks of trees, especially the mulberry-tree and elm, but chiefly of the bamboo and cotton-tree. In fact, almost each province has its several paper. The preparations of paper made of the barks of trees may be instanced in that of the bamboo, which is a tree of the cane or reed kind. The second skin of the bark, which is soft and white, is ordinarily made use of for paper: this is beat in fair water to a pulp, which they take up in large moulds, so that some sheets are above twelve feet in length: they are completed, by dipping them, sheet by sheet, in alum-water, which serves instead of the size among us, and not only hinders the paper from imbibing the ink, but makes it look as if varnished over. This paper is white, soft, and close, without the least roughness; though it cracks more easily than European paper, is very subject to be eaten by the worms, and its thinness makes it liable to be soon worn out. Cotton-paper is a sort of paper which has

been

been in use upwards of six hundred years. In the French king's library are manuscripts on this paper, which appear to be of the tenth century; and from the twelfth century, cotton manuscripts are more frequent than parchment ones. Cotton-paper is still made in the East Indies, by beating cotton rags to a pulp.

Linen, or European paper, appears to have been first introduced among us towards the beginning of the fourteenth century; but by whom this valuable commodity was invented, is not known.

Paper is of various kinds, and used for various purposes: with regard to colour, it is principally distinguished into white, blue, and brown; and, with regard to its dimensions, into atlas, elephant, imperial, super-royal, royal, medium, demy, crown, fool's-cap, and pot-paper.

Blotting PAPER, is paper not sized, and into which ink readily sinks: it is used in books, &c. instead of sand, to prevent blotting, and by chymists, &c. for filtering.

Blistered PAPER, white paper washed over with a sponge dipped in foot water. It is used by the painters in crayons to save labour in places which are to be shadowed the same depth of the taint of that paper. The lights are laid in with white.

Marbled PAPER. See *Marbling*.

PAPER Hangings, furniture now greatly used. The paper manufactured for hangings is of several kinds, some being made in representation of stucco-work, for the covering ceilings, or the sides of halls, stair-cases, passages, &c. and others in imitation of velvet, damask, brocades, chints, or other such silks and stuffs as are employed for hanging rooms. The principal difference in the manufacture lies, however, in the grounds; some of which are laid in varnish, and others in the common vehicles for water-colours; and in the raising a kind of coloured embossment by chapt cloth. This embossed sort is called flock-paper; the art of making which is of very late invention, and is a great improvement of the manufacture of paper hangings, both with regard to the beauty and durability.

Unwrought PAPER proper for Hangings. The kind of paper employed for making the paper hangings is a sort of coarse cartoon manufactured for this purpose; and there being a particular duty on paper-hangings, it is required under considerable penalties to be stamped before it be painted, or otherwise decorated for this purpose. There is no occasion, however,

to be more particular in explaining the qualities of this kind of unwrought paper; because it is to be had of all the wholesale stationers manufactured in a proper manner.

Colours proper to be used for PAPER Hangings.—The colours proper to be used for the painting or colouring the paper hangings, are all the kinds that can be used in water and varnish.

Manner of painting the PAPER Hangings.—There are three methods by which paper hangings are painted: the first by printing on the colours; the second by using the stencil; and the third by laying them on with a pencil, as in other kinds of painting.

PAPIER Maché, paper reduced to the consistence of a pulp by boiling and beating. When this pulp is of a proper consistence, it is cast in a moist state in proper moulds; and having been previously mixed with some gummy, or other adhesive body, will acquire so considerable a degree of tenacity and hardness, as to retain the figure, and answer the end of wood turned, or carved, or plaster cast into the same form.

The paper used for making the papier maché may be of any kind, according to the nicety required in the work to which it is applied. For very coarse purposes, brown may be employed; and for the most nice, writing-paper is best: and it is not very material whether the paper be clean or foul, or whether it be written or printed upon, or blank: except where it is intended to be only moulded, and not coloured, or varnished afterwards; which is seldom the case.

The gum or adhesive body used for giving the due texture to the papier maché may be gum-arabic, glue, or isinglass; but for common purposes, gum-arabic, or glue are used, isinglass being too dear; and indeed gum-arabic has an advantage over either of the other, of not shrinking near so much in drying.

The preparation of the papier maché may be as follows. "Take any quantity of paper, and boil it in water, stirring it about with a wooden spatula, till it becomes of a pasty substance, and appear to have lost its cohesion. Pour off then the water from it, and beat it in a mortar, or such kind of machine as will have the same effect, till it be perfectly soft and yielding pulp. Prepare, in the mean time, a strong gum water, by dissolving gum-arabic in water; and having pressed the greatest part of the water out

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of the pulp, add the gum water to it in such proportion, that they may produce together the consistence of a thick fluid. Put them then into a proper vessel, and boil them slowly, till they form a paste of the right consistence for casting. The papier maché will then be ready prepared for working with the proper moulds; but the stiffness of the paste may be varied with advantage, according to the nature of the work. That intended for pieces where the figure is simple, and has no sharp or embossed work, requiring to be stiffer; while the embossed work, or other such as has relieved parts, should be thinner. The using glue or size, instead of gum-arabic, makes a saving, and will answer extremely well in the case of boxes, or any other pieces of a simple or flat form, because the shrinking may be allowed for in the figure of the moulds; but for embossed work, or designs where several parts must be joined together, the use of gum arabic will be found more expedient, as the relative proportions will be much better preserved.

The moulds in which the papier maché is cast may be either of plaster of Paris or wood. For embossed work, or designs of a more complex kind, plaster is preferable: but for boxes, cups, or simpler forms, the moulds may be best of wood, as such will last for a long time, and not require renewing so often, from the unavoidable wear, or the injury of a slight accidental violence, as those made of plaster. But in the choice of moulds, and subjects to which they are applied, regard should be had to the figure, with respect to its roundness, or projecting parts; for embossed work or frames of any kind, where there are a variety of angles on one side, and a flat plainness on the other, are most expediently managed in plaster: and where there are nice joints, as in the case of boxes, or where the figure must be preserved on both sides, wood is much more proper. The plaster moulds for casting the papier maché must be made in the same manner as those for casting in plaster. See *Casting*.

But it is peculiarly necessary in casting the papier maché to grease the moulds extremely well; otherwise there will be a cohesion betwixt the matter cast and the moulds, that will be destructive to both. Where any subject cast is of considerable extension, and one side of it a blank reverse, as in the case of bas-reliefs, and other ornaments of that nature, it is

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usual to lay slips of whole strong paper over the papier maché; such paper being first well moistened with gum-water, or strong size, which is rather better in this case. This not only makes a saving, but is really an advantage to the work, as it adds greatly to the strength and tenacity, and more especially preserves it, during the time of its drying, from the injuries of slighter violence: to answer this end more effectually, the paper itself applied to this purpose should, however, be very strong, and where the nature of the subject admits of it, laid on several times doubled.

The wooden moulds, which are the most proper sort for forming boxes, cups, or flat pieces of any kind, where there is no embossed work, must be made in two parts; or, more explicitly, there must be a convex part and a concave part; betwixt which a space must be allowed for the figure of the subject that is to be cast. These may be best made of box, or other hard wood turned into the proper figure: and it is expedient to have two or three small perforations, or holes, through the substance of the wood of the concave part near the middle, to let out the fluid when the papier maché is compressed, to give it the due form. The hollow betwixt the convex and concave parts of the mould may be about a seventh or eighth part of an inch thick, in the case of snuff or dressing-boxes, or other pieces of the like magnitude; but it may be enlarged when bigger subjects come in question. The moulds, when first used, should be well greased, and placed before a fire, that they may imbibe as much as possible of the grease; which will render the oiling them afterwards, each time they are employed, more effectual.

When the moulds are prepared, the surface of the concave or hollow part must be spread all over with the paste, as evenly as possible, and as nearly as can be judged, of the thickness of the hollow betwixt the two parts; and then the cover or solid part of the mould must be put over the paste, and compressed till it be in its proper place. The cast being thus made, it must be suffered to remain in the mould till it gain a sufficient strength and tenacity of parts, by drying, to be able to maintain its form when taken out; and then, being freed from both parts of the mould, it must be dried; and afterwards varnished or painted, according to the purpose for which it is designed.

PAPILIO,

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PAPILIO, the butterfly, in zoology, a numerous genus of four-winged insects, distinguished by clavated antennæ. The number of butterflies is so great, that authors commonly divide them into classes, or subdivisions, according to the number of their legs, some having six, and others only four legs, under each of which are comprehended a multitude of beautiful species, distinguished by the different colours and variegations of their wings.

PAPILIONACEOUS, among botanists, an appellation given to the flowers of certain plants, from their resembling the figure of a butterfly.

PAPILLA, in anatomy, a name given to the nipple of the breast, and also to the small eminences of the skin and tongue.

PAR, in commerce, any two things equal in value; and in money affairs, it is so much as a person must give of one kind of specie, to render it just equivalent to a certain quantity of another.

PARABLE, a fable, or allegorical instruction, founded on something real or apparent, in the nature of history, from which a moral is drawn, by comparing it with something in which the hearers are more immediately concerned.

PARABOLA, in geometry, a figure arising from the section of a cone, when cut by a plane parallel to one of its sides. See *Conic Section*.

From the same point of a cone, therefore, only one parabola can be drawn: all the other sections within these parallels being ellipsis; and all without hyperbolas.

To describe a parabola by a continual motion. — Let the straight rule G R (plate XL. fig. 7.) be fixed on a plane, then take another rule as R D C right-angled at D, and let its side D C slide along G K; take a string equal in length to the side R D, and fix one end of it in any point of the plane as in F, and the other end at R the extremity of the rule; then while D C slides along G K, keep by a pin P the string R P F constantly as close D R as may be, so that it may be always straight, the pin at P will by this motion describe the curve P A Q of a parabola.

The line G K is called the directrix, or director, and the point F the focus of the parabola.

From this description it may easily be seen that the distance of any point of the parabola from the focus, is equal to the perpendicular let fall from that point on

P A R

the directrix; that is, $FP = PD$: consequently when D comes to B, then P must fall in A, whence $AF = AB$.

Properties of the PARABOLA.—The square of any ordinate is equal to the rectangle of the abscissa, and four times the distance of the focus from the vertex, that is $PM^2 = AM \times 4AF$. For $PF^2 = PM^2 + FM^2$, but $PF = PD = BM$; then $BM^2 = PM^2 + MF^2 = FF^2 + 4AM \times AF$ (Eu. 8. 1.); therefore $PM^2 = AM \times 4AF$.

When the point m falls between the vertex A and focus F, then $Bm^2 = (fp^2 =) Fm^2 + mp^2$; also $Bm^2 = 4AF \times Am + Fm^2$; whence $4AF \times Am = mp^2$.

Let $AF = a$, AM or $A m = x$, PM or $pm = y$; then $4ax = yy$, the equation of the parabola, wherein $4a$ is called the *latus rectum*, or right parameter of the parabola.

To draw a tangent to any point of the parabola, as P. Take $AT = AM$, or $FT = FP$, draw TP, it will be the tangent required.

The perpendicular on the tangent, from the focus, is a mean proportional between the distance from the vertex to the focus, and the distance of the focus from the point of contact; or $AF : EF :: EF : EP$. For the angles AFE and EPF are equal; and the angles EAF, FMP, PEF, are each right; therefore the triangles EAF, FPF, are similar; whence $AF : EF :: EF : FP$.

All lines within the parabola which are drawn parallel to the axis, are called diameters. Thus PI (fig. 8) parallel to the axis AM is a diameter; and ordinates to those diameters are right lines, drawn parallel to the tangents at the vertices of those diameters. Thus OI is an ordinate to the diameter PI.

The parameter of any diameter is a right line, such that the product under the same, and the abscissa, is equal to the square of the semi-ordinate.

Dividing PARABOLA, a name given by Sir Isaac Newton to five different lines of the third order, expressed by the equation $y = ax^3 + bx^2 + cx + d$.

PARABOLIC Conoid, a solid figure generated by the rotation of a parabola about its axis. Its solidity is half that of its circumscribing cylinder, being made up of a series of circles in arithmetical proportion, whose number of terms is expressed by the axis of the conoid, first term 0, and last term the area of the base. A parabolic conoid is to a cylinder

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of the same base and height, as 1 to 2, and to a cone of the same base and height as $1\frac{1}{2}$ to 1, or as 3 to 2.

PARABOLIC Pyramidoid, a solid figure generated by supposing all the squares of the ordinates applicables in the parabola so placed, as the axis shall pass through all the centers in right angles; in which case the aggregate of the planes will form the parabolic pyramidoid.

The solidity hereof is had by multiplying the base by half the altitude; the reason of which is obvious; for the component planes being a series of arithmetical proportionals beginning from 0, their sum will be equal to the extremes multiplied by half the number of terms.

PARABOLIC Space, the area contained between any entire ordinate and the curve of the incumbent parabola.

Segment of a PARABOLIC Space, that space included between two ordinates.

PARABOLIC Spindle, a solid formed by the revolution of a parabola about an ordinate rightly applied. This solid is eight fifteenths of its circumscribing cylinder.

PARABOLOIDES, in geometry, parabolas of the higher kind; the general equation of these curves is $pm - \frac{1}{2}x^2m - \frac{1}{2}ym$, wherein m may be expounded by any number (greater than 1) at pleasure.

PARACENTESIS, in surgery, an operation commonly called tapping. See *Hydrocele*.

PARADE, the placing any thing to public view, with all its advantages and ornaments.

PARADE, in war, a place where the troops meet to go upon guard, or any other service.

PARADE, in fencing, the action of parrying, or turning off any thrust.

PARADISE, a term principally used for the garden of Eden, in which Adam and Eve were placed immediately upon their creation. As to this terrestrial paradise, there have been many enquiries about its situation. It has been placed in the third heaven, in the orb of the moon, in the moon itself, in the middle region of the air, above the earth, under the earth, in the place possessed by the Caspian sea, and under the arctic pole. The learned Huetius places it upon the river produced by the conjunction of the Tigris and Euphrates, now called the river of the Arabs, between this conjunction and the division made by the same river before it falls into the Persian sea. Other geographers have placed it in Armenia, be-

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tween the sources of the Tygris, the Euphrates, the Araxis, and the Phasis, which they suppose to be the four rivers described by Moses. The celestial paradise is that place of pure and refined delight in which the souls of the blessed enjoy everlasting happiness. In this sense it is frequently used in the New Testament: our Saviour tells the penitent thief on the cross, "This day shalt thou be with me in paradise." And St. Paul speaking of himself in the third person, says, "I knew a man who was caught up into paradise, and heard unspeakable words, which is not lawful for a man to utter."

Mahomet has promised his followers a paradise of mere sensual delights.

Bird of PARADISE, *Paradisæa*, in ornithology, a genus of birds of the order of picæ.

Of this genus there are a great many elegant species.

PARADOX, in philosophy, a proposition seemingly absurd, as being contrary to some received opinion, but yet true in fact.

No science abounds more with paradoxes than geometry: that the right line should continually approach to the hyperbola, and yet never reach it, is a true paradox; and in the same manner, a spiral may continually approach to a point, and yet not reach it, in any number of revolutions, however great.

PARAGOGÉ, in grammar, a figure whereby a letter is added to the end of a word.

PARAGRAPH, a section or division of a chapter, and in references is marked thus ¶.

PARALEPSIS, in rhetoric, the pretence of passing over something, and yet mentioning it by the bye.

PARALIPOMENA, a supplement of things omitted in a preceding work.

PARALLACTIC, something relating to the parallax of the heavenly bodies.

PARALLAX, *Parallaxis*, in astronomy, a change of the apparent place of any heavenly object in the sphere of heaven, caused by its being seen from different points of view.

Annual PARALLAX of a phenomenon, the change of its apparent place in the sphere of the heaven, which is caused by its being viewed from the earth in different parts of her orbit: the annual parallax of all the planets is considerable, but that of the fixed stars is insensible. See *Aberration*.

PARALLAX, in levelling, denotes the



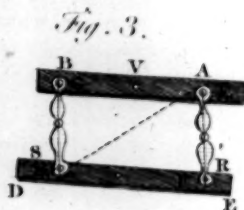
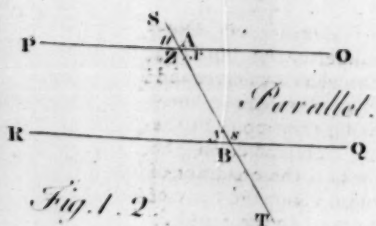


Fig. 4. Parallelogram.

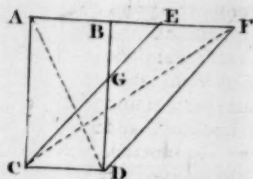
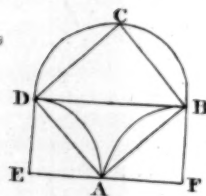


Fig. 5. Ptolemy's.



Perpetual Motion.

Fig. 8.

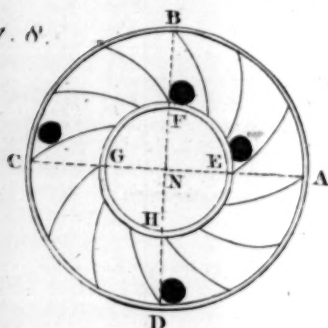


Fig. 6. Pendulum.

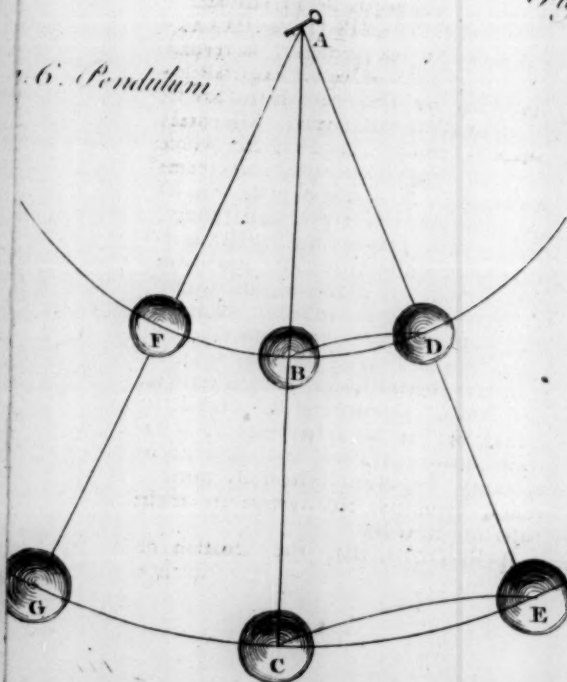
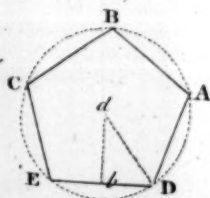


Fig. 7. Pentagon.



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the angle contained between the line of true level and that of apparent level.

PARALLEL, in geometry, is applied to lines, figures, and bodies, every where equidistant from each other, and which, though infinitely produced, would never meet; thus, the line *OP* (plate *XLI*. fig. 1.) is parallel to *QR*.

Parallel lines stand opposed to lines converging and diverging. Geometricians demonstrate, that if two parallels *OP* and *QR* (fig. 2.) be cut by a transverse line *ST* in *A* and *B*; 1. The alternate angles x and y are equal. 2. The external angle u is equal to the internal opposite one y ; and, 3. the two internal opposite ones x and y are also equal to two right angles.

It is shewn on the principles of optics, that if the eye be placed between two parallel lines, they will appear to converge towards a point opposite to the eye. And if they run to such a length, as that the distance between them be but as a point thereto, they will there appear to coincide.

Parallel lines are described by letting fall equal perpendiculars, and drawing lines through the extremes.

PARALLEL Planes, such planes as have all the perpendiculars drawn betwixt them equal to each other.

PARALLEL Rays, in optics, those which keep at an equal distance from the visible object to the eye, which is supposed to be infinitely remote from the object.

PARALLEL Ruler, or **Parallelism**, an instrument consisting of two wooden, brass, &c. rulers, *AB*, *CD*, (fig. 3.) equally broad every where, and so joined together by the cross blades *EF* and *GH*, as to open at different intervals, accede and recede, and yet still retain their parallelism.

The use of this instrument is obvious; for one of the rulers being applied to *RS*, and the other withdrawn to a given point *V*, a right angle *AB*, drawn by its edge, through *V*, is a parallel to *RS*.

PARALLELS, or **PARALLEL Circles**, in geography, called also parallels or circles of latitude, are lesser circles of the sphere conceived to be drawn from west to east through all the points of the meridian, commencing from the equator to which they are parallel, and terminating with the poles. They are called parallels of latitude, because all places lying under the same parallel, have the same latitude.

PARALLELS of Latitude, in astronomy, lesser circles of the sphere parallel to the ecliptic, imagined to pass through every degree and minute of the

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colours. They are represented on the globe by the divisions on the quadrant of altitude, in its motion round the globe, when screwed over the pole of the ecliptic. See *Globe*.

PARALLELS of Altitude, or **Almacantars**, circles parallel to the horizon, imagined to pass through every degree and minute of the meridian between the horizon and zenith, having their poles in the zenith. They are represented on the globe by the divisions on the quadrant of altitude, in its motion about the body of the globe, when screwed to the zenith.

PARALLELS of Declination, in astronomy, the same with parallels of latitude in geography.

PARALLEL Sphere, that situation of the sphere wherein the equator coincides with the horizon, and the poles with the zenith and nadir; consequently the poles of the world become the poles of the horizon. In this sphere all the parallels of the equator become parallels of the horizon, consequently no stars ever rise or set, but all turn round in circles parallel to the horizon; and the sun, when in the equinoctial, wheels round the horizon the whole day. After his rising to the elevated pole, he never sets for six months; and after his entering again on the other side of the line, never rises for six months longer. This is the position of the sphere to such as live under the poles, and to whom the sun is never above $23^{\circ} 30'$ high.

PARALLEL Sailing, in navigation, the sailing under a parallel of latitude.

PARALLELEPIPED, or **PARALLELOPIPED**, in geometry, a regular solid, comprehended under six parallelograms, the opposite ones whereof are similar, parallel, and equal. All parallelepipeds, prisms, cylinders, &c. whose bases and heights are equal, are themselves equal. A diagonal plane divides a parallelepiped into two equal prisms; so that a triangular prism is half a parallelepiped upon the same base, and of the same altitude. All parallelepipeds, prisms, cylinders, &c. are in a ratio compounded of their bases and altitudes; wherefore, if their bases be equal, they are in proportion to their altitudes; and conversely. All similar parallelepipeds, cylinders, cones, &c. are in a triplicate ratio of their homologous sides, and also of their altitudes. Equal parallelepipeds, prisms, cones, cylinders, &c. reciprocate their bases and altitudes.

PARALLELISM, the situation or quality

quality whereby any thing is denominated parallel.

PARALLELISM of the Earth's Axis, in astronomy, that situation of the earth's axis, in its progress through its orbit, whereby it is still directed towards the pole-star; so that if a line be drawn parallel to its axis, while in any one position, the axis, in all other positions, will be always parallel to the same line. This parallelism is the necessary result of the earth's double motion, namely round the sun, and its own axis. And to it we owe the vicissitudes of seasons, and the inequality of day and night.

PARALLELISM of the Rows of Trees—These are never seen parallel, but always inclining to each other towards the farther extreme.

Hence mathematicians have taken occasion to enquire in what lines the trees must be disposed to correct this effect of the perspective, and make the rows still appear parallel. The two rows must be such, as that the unequal intervals of any two opposite or correspondent trees may be seen under equal visual rays.

On this principle some have shewn, that the two rows of trees must be two opposite semi-hyperbolas.

M. Varignon, in *Mem. de l'Acad. ann. 1717*, renders the problem much more general, and requires not only that the visual angles be equal, but to have them increase or decrease in any given ratio, provided the greatest do not exceed a right angle. The eye requires to be placed in any point, either just at the beginning of the ranges, beyond, or on this side.

He supposes the first row to be a right line, and seeks what line the other must be, which he calls the curve of the range: this he finds must be an hyperbola to have the visual angles equal. The streight and hyperbolic rows will be seen parallel to infinity; and, if the opposite semi-hyperbola be added, we shall have three rows of trees, the straight one in the middle, and all three parallel.

It is sufficient that this second hyperbola have the same center, its vertex in the same right line, and the same conjugate axis. Thus the two hyperbolas may be of all the different kinds possible, yet all have the same effect.

If it be required to have the trees appear under decreasing angles, the straight row being laid down as before, he shews, that if the decrease be in a certain ratio, the other line must be a parallel straight line. But he goes yet farther, and sup-

posing the first row any curve whatever, he seeks for another that shall make the rows have any effect desired.

PARALLELOGRAM, in geometry a quadrilateral right-lined figure, whose opposite sides are parallel and equal to each other. It is generated by the equable motion of a right line always parallel to itself. When it has all its four angles right, and only its opposite sides equal, it is called a rectangle or oblong. When the angles are all right, and the sides equal, it is called a square. If all the sides be equal, and the angles unequal, it is called a rhombus or lozenge; and if the sides and angles be unequal, it is called a rhomboides.

Properties of the PARALLELOGRAM.—In every parallelogram of what kind soever, as $ABCD$ (plate xli fig. 1.) a diagonal DA divides it into two equal parts; and the angles diagonally opposite B, C , and A, D , are equal; the opposite angles of the same side C, D , and A, B , &c. are together equal to two right angles; and each two sides, together, greater than the diagonal.

Two parallelograms $ABCD$, and $E C D F$, on the same or equal base CD , and of the same height AC , or between the same parallels AF, CD , are equal: and hence two triangles CDA , and CDE , on the same base and of the same height, are also equal. Hence, also, every triangle GFD is half a parallelogram, $ACDB$ upon the same or an equal base CD , and of the same altitude, or between the same parallels. Hence, also, a triangle is equal to a parallelogram, having the same base and half the altitude, or half the base and the same altitude.

Parallelograms, therefore, are in a given ratio compounded of their bases and altitudes. If then the altitudes be equal, they are as the bases, and conversely. In similar parallelograms and triangles, the altitudes are proportional to the homologous sides, and the bases are quadrato proportionably thereby. Hence similar parallelograms and triangles are in a duplicate ratio of their homologous sides; as also of their altitudes, and the segments of their bases; they are, therefore, as the squares of the sides, altitudes, and homologous segments of the bases.

In every parallelogram, the sum of the squares of the two diagonals is equal to the sum of the squares of the four sides. For if the parallelogram be rectangular, it follows, that the two diagonals are equal: and consequently the square of

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a diagonal, or which comes to the same thing, the square of the hypotenuse of a right angle, is equal to the squares of the sides.

If the parallelogram be not rectangular, and of consequence the two diagonals unequal, which is the most general case, the proposition becomes of vast extent; for instance, in the whole theory of compound motions, &c. There are several ways of demonstrating this problem: the analytical method is shewn by Sir Isaac Newton, in his Universal Arithmetic.

To find the area of a rectangled parallelogram, multiply the length supposed $= 354$ in the breadth $= 132$, the product will be the area of the parallelogram; namely, 46728. Hence, 1. Rectangles are in a ratio compounded of their sides. 2. If, therefore, three right lines be continually proportional, the square of the middle one is equal to the rectangle of the two extremes; and if four right lines be proportional, the rectangle under the two extremes is equal to that under the two middle terms.

Other parallelograms, not rectangular, have their areas found by resolving them, by diagonals, into two triangles, and adding the areas of the separate triangles into one sum.

PARALOGISM, in logic, a false reasoning, as when a consequence is drawn from principles that are false; or, though true, are not proved; or when a proposition is passed over that should have been proved by the way. A paralogism differs from a sophism in this, that the sophism is committed out of design and subtlety, and the paralogism out of mistake and for want of sufficient light and application.

PARALYSIS, the palsy. See *Palsy*.

PARALYTIC, a person afflicted with the palsy.

PARAMETER, in conic sections, a constant line; otherwise called latus rectum when applied to the principal axis of the figure.

PARAMOUNT, in law, the supreme lord of the fee. The lords of these honours or manors that have manors under them are stiled lords paramount; and the king, by our law, is the chief lord of all the lands in England. See *Manor*.

PARAPET, in fortification, an elevation of earth designed for covering the soldiers from the enemies cannon or small shot. The thickness of the parapet is from eighteen to twenty feet; its height is six feet on the inside, and four or five on the

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outside. It is raised on the rampart, and has a slope above called the superior talus, and sometimes the glacis of the parapet. The exterior talus of the parapet is the slope facing the country: there is a banquette or two for the soldiers, who defend the parapet to mount upon, that they may the better discover the country, fosse, and counterscarpe, and fire as they find occasion.

Parapet of the covert way, or corridor, is what covers that way from the sight of the enemy, which renders it the most dangerous place for the besiegers because of the neighbourhood of the faces, flanks, and curtains of the place.

PARAPET is also a little wall raised breast high on the banks of bridges, keys, or high buildings, to serve as a stay, and prevent people's falling over.

PARAPHERNALIA, or PARAPHERNA, in the civil law, those goods which a wife brings her husband besides her dower, and which are still to remain at her disposal exclusive of her husband, unless there is some provision made to the contrary in the marriage contract.

PARAPHIMOSIS, in medicine, a disorder of the penis, wherein the prepuce is shrunk, and withdrawn behind the glans, so as not to be capable of being brought to cover the same, which frequently happens in venereal disorders.

The cure of a paraphimosis, according to Heister, consists chiefly in returning the contracted prepuce over the naked glans; but as a violent inflammation is usually the chief cause of its being so difficult to return the prepuce in the paraphimosis, it may be first proper to make use of discutient and emollient fomentations or cataplasms, with camphorated spirit of wine before the prepuce is attempted to be drawn over the glans, which being affected, all the other bad symptoms will vanish of course. However, some surgeons prefer the use of cold water, because the former remedies often augment the influx of the blood to the parts, and so increase the tumor. But when the penis, scrotum, and lower part of the abdomen, are immersed in cold water, with plentiful bleeding, the tumor generally subsides in a short time: the penis is then to be held between the surgeon's two foremost fingers of each hand; and the glans having been first lubricated with oil or butter, is to be forcibly pressed back with his thumbs, whilst the prepuce is at the same time drawn

drawn forward under his fingers, so as to cover the denudated glands; but when the inflammation is not very large, it may be often sufficient only to bathe the parts in water, when there is little or no virulency. On the contrary, when the tumefied penis tends to mortify through the violence of the inflammation, or long continuance of the disorder, it will be most advisable to bleed the patient first in the arm, and then in the vena dorsalis penis, in which last it should be continued till the tumor subsides, and then the prepuce may be drawn over the glands as before.

PARAPHRASE, *waq-e-shari*, an explanation of some text, in clearer and more ample terms, whereby is supplied what the author might have said or thought on the subject.

PARAPHRENITIS, in medicine, an inflammation of the diaphragm.

PARAPLEGIA, or **PARAPLEXIA**, in medicine, a species of paralysis, or palsy, usually succeeding an apoplexy.

PARASANG, an ancient Persian measure, different at different times, and in different places; being sometimes thirty, sometimes forty, and sometimes fifty *stadia*, or furlongs.

PARASALENE, in physiology, a mock moon, a meteor, or phenomenon, encompassing, or adjacent to, the moon, in form of a luminous ring; wherein are sometimes observed one, sometimes two, apparent images of the moon.

The paraselones are formed after the same manner as the parhelia, or mock suns. See *Paroelium*.

PARASITES, or **PARASITICAL PLANTS**, in botany, such plants as are produced out of the trunk or branches of other plants, from whence they receive their nourishment, and will not grow upon the ground, as the mistletoe, &c.

PARASYNANCHE, in medicine, a kind of angina or quincy, wherein the exterior muscles of the throat are inflamed. See *Quinzy*.

PARATHENAR, in anatomy, the name of two muscles of the foot.

PARATHESESIS in grammar, the same with apposition.

PARATHESESIS is also the same with parenthesis. See *Parenthesis*.

PARCÆ, in the heathen mythology, goddesses supposed to preside over the accidents and events, and to determine the date or period of human life. The ancients reckoned the *parcæ*, who were also called *fates* and *destinies*, to be three

in number, because all things have their beginning, progress, and end. They were called *Atropos*, *Clotho*, and *Lachesis*, and are represented as spinning the thread of human life, in which employment *Clotho* held the distaff, *Lachesis* turned the wheel, and *Atropos* cut the thread. Their persons are variously described: sometimes they are represented as old women, one holding a distaff, another a wheel, and a third a pair of scissors. Others paint *Clotho* in a robe of divers colours, with a crown of stars upon her head, and holding a distaff in her hand; *Lachesis* in a garment covered with stars, and holding several spindles; and *Atropos* they clad in black, cutting the thread with a large pair of scissors.

PARCHMENT, in commerce, the skins of sheep or goats prepared in such a manner as to render it proper for writing upon, covering books, &c. The manufacture of parchment is begun by the skinner, and finished by the parchment-maker.

What is called vellum, is only parchment made of the skins of abortives, or at least sucking calves. This has a much finer grain, and is whiter and smoother than parchment; but is prepared in the same manner, except its not being passed through the lime-pit.

PARDON, in law, is the forgiveness of an offence against the king or the laws.

PAREGORICS, in pharmacy, medicines that assuage pain, otherwise called anodynes.

PARELCON, in grammar, a figure by which a word or syllable is added to the end of another.

PARENCHYMA of *Plants*. Grew applies the term parenchyma to the pith or pulp, or that inner part of a fruit or plant through which the juice is supposed to be distributed. This, when viewed with a microscope, appears to resemble marrow, or rather a sponge, being a porous, flexible, dilatible substance. Its pores are innumerable and exceedingly small, receiving as much humour as is requisite to fill and extend them, which disposition of pores it is that is supposed to fit the plant for vegetation and growth.

PARENT, *Parentis*, a term of relation applicable to those from whom we immediately receive our being.

PARENTHESIS, in grammar, certain intercalary words, inserted in a discourse,

course, which interrupt the sense, or thread, but seem necessary for the better understanding of the subject. The proper characteristic of a parenthesis is, that it may be either taken in or left out, the sense and the grammar remaining intire, as the king is (notwithstanding his attachment to favourites) a very honest man. In speaking, the parenthesis is to be pronounced in a different tone; and in writing, it is inclosed between (), called also a parenthesis, but commonly a bracket, or croschet, to distinguish it from the rest of the discourse. The politest of our modern writers avoid all parenthesis, as keeping the mind in suspense, embarrassing it, and rendering the discourse less clear, uniform, and agreeable.

PARGET, in natural history, a name given to several kinds of gypsum, or plaster-stone. See *Plaster*.

PARGETING, in building, is used for the plastering of walls, and sometimes for the plaster itself.

PARHELIUM, or **PARHELION**, in physiology, a mock sun, or meteor, in the form of a very bright light, appearing on one side of the sun. The parhelia are formed by the reflection of the sun's beams on a cloud properly posited. They usually accompany the coronæ, or luminous circles; and are placed in the same circumference and at the same height. Their colours resemble that of the rainbow, the red and yellow are on the side towards the sun, and the blue and violet on the other. There are coronæ sometimes seen without parhelia, and vice versa. Parhelia are double, triple, &c. and in 1619, a parhelion of five suns was seen at Rome; and 1666, another at Ailes of six. M. Mariotte accounts for parhelia from an infinity of little particles of ice floating in the air, that multiply the image of the sun by refraction or reflection.

PARIETALIA OSSA, in anatomy, the second and third bones of the cranium; being called also ossa-bregmatis, and ossa-sincipitis.

PARIETARIA, pellitory of the wall, in botany. It is perennial, common on old walls and among rubbish, and flowers in May. The leaves of pellitory of the wall have been used in cataplasms for dissolving inflammatory swellings: decoctions of them, and their expressed juice, have been given as emollient diuretics, in nephritic cases and ischurics; and are said, when long persisted on, to be useful aperients or sweeteners in cutaneous

defections. The plant appears to be of no great activity, being rather oleraceous than medicinal.

* **PARIS**, the capital city of France, in the principality or government of the isle of France. It is advantageously situated, and one of the most considerable places in the world. It was anciently a small place, though founded in the times of the ancient Gauls, and was then called Lutetia. When the Romans came into Gaul, this was the capital of a people called the Parisians, from whom, in process of time, it came to be called Paris. It contains 22,000 houses, and 800,000 inhabitants; and many of the houses are seven stories high. There are fifty-two parishes in the town and suburbs; 134 convents, of which fifty-six are for men, and seventy-eight for women. Paris is generally divided into three parts, the town, which is the largest, is seated on the N. side of the river Seine; the city, which is the least but the most ancient, consists of three little islands in the middle of the Seine, and the university, which lies on the S. side of the river: all which are divided into 20 quarters or wards. The whole town is of a circular form, about eighteen miles in circumference, and six in diameter. The houses look handsome, being built of stone, and most of them having ash-windows. The cathedral of Notre Dame, seated on a little island of the river Seine, is a venerable old Gothic structure, built in the form of a cross, and is 174 feet in length, sixty in breadth, and 100 in height. The roof is supported by 120 large pillars, and the front is admired for its sculpture, there being the statues of twenty-eight of their kings. In the middle there is a small spire, and at the west end are two large square towers, 389 steps high, flat at the top, with balustrades round them, which make the front look spacious and noble. From these towers you have a prospect of the whole city. There are in Paris a great number of palaces and hotels, of which we shall only mention some of the principal. The Louvre is distinguished into the Old and the New. The New Louvre is built on the spot where there was a castle. The grand front is fifty-five yards in length, and consists of three advanced structures and two peristiles. The principal entrance is into the middle structure, which is adorned with eight columns. The pediment is very remarkable, as it consists only of two stones, fifty-four feet in length each, eight broad,

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and eighteen thick. Each of the peristyles, which are between the three advanced structures, is fifty-four yards long, and twenty broad. Their columns, which are of the Corinthian order, are fluted, and placed two and two together, being each three feet seven inches in diameter, and support a ballustrade, which runs all along the top. The Old Louvre is three stories high, and the advanced structures are adorned with columns. The windows of the second are highly esteemed by the curious. The inside of the Louvre corresponds with the magnificence of the outside. The apartments of the queen contains a curious cieling and very fine landscapes. The academy of sciences, belles-lettres, architecture, and painting, are all kept in the Louvre. The statues preserved in one of these halls are very remarkable, though they are only copies after antiques. The Thuilleries is composed of five pavillions, whose architecture is much admired. The garden of this palace has the finest and most frequented walks in Paris. It is 720 yards in length, and 136 in breadth. Neither servants in livery, nor any low people, are permitted to enter it during the time of walking. The terrace on the side of the river, which is the greatest ornament to the garden, is 560 yards in length, and twenty-eight in breadth. On the side of the palace are six statues and four vases of white marble. The palace of Luxemburg is the most regular structure in France, and is also very large and magnificent. There are a great many squares in Paris, of which three are most remarkable, on account of the statues of bronze with which they are adorned, and these are, the Place Royale, that of Victoires, and that of Lewis le Grand. Of the gates, that called Port St. Denis is the most beautiful. It is seventy-two feet high, and as many broad. It is accompanied with two pyramids loaded with trophies of war. The Port St. Anthony was built as a triumphal arch for Henry II. It is adorned with many embellishments in sculpture, and has a great number of inscriptions, in memory of Lewis XIV. The port of St. Bernard is twenty yards high, and sixteen broad; and on that side next the city is the figure of Lewis XIV. in alto relievo. The port of St. Martin was built in 1674, in the form of a triumphal arch; and the architecture is of the rustic kind, with basso relievos on the pediments. It is about fifty feet high, and as many broad. Among the

bridges, the most remarkable is the Pont-Neuf, which was begun in 1578, but was not finished till 1604. It is 340 yards in length. It consists of twelve arches, and the equestrian statue of Henry IV. is its greatest ornament. The Pont Royal is not so well ornamented as the former; but it is as strong, and enjoys as agreeable a prospect. It is 114 yards in length, seventeen in breadth, and consists of five arches. The Pont Notre Dame was built in 1507, and has houses built on each side. There are in Paris several other bridges. The observatory royal was erected by Lewis XIV. in 1677: here the astronomers are maintained at the expence of the king, to make their observations. There are several hospitals in Paris, where the poor and the infirm are assisted. It is said, that in the Hotel Dieu there are generally above 1000 patients; but strangers seldom go to see any but the General Hospital, and Petites Maisons, where mad people are kept. The General Hospital has seldom less than 10,000 persons; and there are near 3000 girls that learn to make lace, and to work embroidery and tapestry, and these are generally foundlings. The Gobelins stands at the extremity of the street of the suburb of St. Marcel; where there is a great number of persons at work, who make tapestry in the highest perfection; as also embroidery, painting, and sculpture. The university of Paris was founded about the latter end of the eleventh century. It consisted formerly of one hundred colleges; but there are now only fifty-four houses that bear that name, and of these there are no more than eleven where public exercises are performed. One of these is the Sorbonne, which is thought to be one of the finest in Europe; from which the whole university is often called the Sorbonne. The head of the university is called the rector, who must be elected from the faculty of arts. The civil government of Paris is distributed among several courts of justice, the highest of which is the parliament, whose jurisdiction extends over the neighbouring provinces, and is the last resort in all causes where the court does not interpose its authority. The other courts of Paris are the chamber of accounts, the court of aids, the mint, the court of the treasury, the court of the waters and forests; the court of the constable and marshals; the court of admiralty; the chatelet, or the ordinary court of justice for the civil government of the city; the court of the

hotel-de-ville, which takes an account of the city-rents, with the taxes on all provisions brought into Paris; and lastly, the court of the consuls, which takes cognizance of all things relating to trade. The trade of Paris consists chiefly of the manufactures of that city, which are very considerable. These are principally gold and silver stuffs, wrought silks, velvet, tapestry, gold and silver lace, ribbons, linen, and glass. They have two great fairs every year, one in the suburb of St. Germain, which begins the third of February, and continues a fortnight; and the other at St. Laurence's, which begins on the festival of that saint, and ends on the 7th of September. There are six principal bodies or companies of tradesmen, out of which the consuls, who have the regulation of trade, are chosen; namely, the drapers, grocers, apothecaries, mercers, jewellers, skinners, hatters, and goldsmiths. Also the book-sellers, vintners, wine-merchants, wool-merchants, and timber-merchants, have all particular privileges. Paris is 225 miles south-east of London, 235 south of Amsterdam, 625 north-west of Vienna, 625 north-east of Madrid, 675 north-west of Rome, 1200 north-west of Constantinople, and 870 from Lisbon.

PARISH, the precinct of a parochial church, or a circuit of ground inhabited by people belonging to one church, and are under the particular charge of its minister. In England there are nine thousand, nine hundred and thirteen parishes, of which three thousand eight hundred and forty-five are churches impropriate, and the rest are annexed to colleges, or church dignities. In many of these parishes, on account of their large extent, and the number of parishioners, there are several chapels of ease.

PARISH OFFICERS, officers chosen annually to regulate and manage the concerns of the parish. See the articles *Churchwardens* and *Overseers of the Poor*.

PARK, a large inclosure privileged for wild beasts of chase, either by prescription or the king's grant. No person can now erect a park without obtaining a licence under the broad-seal; but there may be such in reputation, though erected without lawful warrant, and the owner may bring his action against persons that kill his deer therein.

PARK is also used for a moveable inclosure, or fold, set up in the fields for sheep to feed and rest in during the night. The park is frequently removed by the

shepherds to dung the ground one part under another.

PARK, a large net, placed on the brink of the sea, with only one entrance, which is next the shore, and which is left dry by the ebb of the tide; so that the fish once got in have no way left to escape.

PARLEY, a conference with an enemy. Hence to beat or sound a parley, is to give a signal for holding such a conference by beat of drum or sound of trumpet.

PARLIAMENT, the grand assembly of the three states of this kingdom, summoned together by the king's authority, to consult of matters relating to the public welfare, and particularly to enact and repeal laws. It consists of the king, the lords spiritual and temporal, and the commons, and is at once the seat of the legislative authority, and the highest court of justice in Great-Britain. In the house of lords, criminal causes are tried on the impeachment of the commons; and this house has an original jurisdiction for the trial of peers upon indictments found by a grand jury; the lords likewise try such causes as come thither on appeals from the court of chancery, and all their decrees are as judgments, and cannot be appealed from. The house of commons examine the right of elections, regulate disputes concerning them, may expel their own members, and commit them to prison; they are the grand inquest of the nation, and present public grievances or delinquents to the king and lords, in order to their being punished. In short, they are the representatives of all the commons in the kingdom, and in them their constituents have placed the highest confidence, by investing them with the power of making laws, and entrusting them with all their liberties and privileges. Originally, new parliaments were called every year; but by degrees their term grew longer. In the reign of king Charles II. they were held a long time, with great interruptions between; but both methods were found of such ill consequence, that, in the beginning of the reign of king William III. an act was passed, by which the term of all parliaments was restrained to three sessions, or three years; this was hence called the triennial act: but since that time, from other views, the period of parliaments has been lengthened to seven years. It is feared long parliaments will be the destruction of this kingdom; and Mr. Sawbridge, member for Hythe, (a real lover of his country) has several times

moved to shorten the duration of parliaments, but to no purpose; for as too many of them obtain a seat in the senate by corruption, they consider it would be more expensive to bribe annually, than once in seven years. A parliament is called by the king's writ or letter directed to each lord, commanding him to appear; and by other writs, directed to the sheriffs of each county, to summon the people to elect two knights for each county, and one or two burgesses for each borough. The number of the members in the house of lords is uncertain, as increasing at the king's pleasure. The members of the house of commons, when full, are five hundred and fifty-three. If three hundred of these members are met, it is reckoned a full house; and forty may compose a house for the dispatch of business.

Upon the holding of a parliament, the king, the first day, sits in the upper house, under a canopy, with the crown on his head, and in his royal robes; and there, by himself, or the lord chancellor, declares the reasons of their meeting, in the presence of both the lords and commons; and then the commons are required to choose a speaker, who is presented to the king, and being approved by his majesty, the business of the parliament goes on.

The lords and commons sit each in a distinct apartment: in the house of lords, the princes of the blood sit by themselves on the side of the throne; at the wall, on the king's right hand, the two archbishops sit by themselves on a form. Below them, the bishops of London, Durham, Winchester, and all the other bishops, sit according to the priority of their consecration. On the king's left hand, the lord treasurer, lord president, and lord privy-seal, sit upon forms above all dukes, marquises, and earls, according to their creation. Across the room are wool-sacks, continued from an ancient custom; and the chancellor, or keeper, being of course the speaker of the house of Lords, sits on the first wool-sack before the throne, with the great seal or mace lying by him; below these are forms for the viscounts and barons. On the other wool-sacks are seated the judges, masters in chancery, and king's council, who are only to give their advice in points of law, but they all stand up till the king gives them leave to sit. The commons sit promiscuously, only the speaker has a chair at the upper end

of the house, and the clerk and his assistant sit at a table near him. Before any business is done, all the members of the house of commons take the oaths of allegiance and supremacy, &c. and subscribe their opinions against transubstantiation, &c. and if any member of that house votes, or sits there during any debate, after the speaker is chosen, without having first taken these oaths, between the hours of nine and four in a full house, he is adjudged a popish recusant convict, and incapable of any office, and forfeits five hundred pounds. The same test the lords too, though they do not take the oaths, are obliged to comply with. When the parliament is thus met, no members are to depart from it without leave. Upon extraordinary occasions, all the members are sometimes summoned, in which case every lord, spiritual and temporal, and every knight, citizen, and burges is to come to parliament, except he can reasonably and honestly excuse himself; or be amerced: that is, respectively, a lord by the lords, and a commoner by the commons.

All members of parliament, in order that they may attend the public service of their country, have the privilege of being freed from arrests, attachments, imprisonments, &c. for debts, trespasses, &c. but not from arrests for treason, felony, and breach of the peace: however, it is ordained by statute, that actions may be commenced, in any of the courts of Westminster, against persons intitled to privilege of parliament, after a prorogation or dissolution, till a new parliament is called, or the same become re-assembled; and likewise after an adjournment for above fourteen days; and the respective courts, in such a case, have power to proceed to judgment, &c. Here the process is to be summons, distress infinite, &c. till the parties shall enter an appearance; and for default thereof, the real or personal estate of the defendant may be sequestered; though the plaintiff may not, in that case, arrest the body of any member of parliament: 12 William III. c. 3.

Anciently all the people had votes in election, till it was enacted by Henry VI. that none but freeholders, who had a yearly revenue of forty shillings, should be admitted to vote for knights of the shire.

The manner of debating upon, and passing bills in parliament, is as follows: any member may move to have a bill brought

brought in, which, upon a question put, being agreed by the majority, this person, with others, is ordered to prepare and bring in the same. When it is ready, a time is appointed for its being read, and after the clerk's reading it, the speaker reads an abstract of it, and puts the question whether or no it shall have a second reading? and after a second reading, the question is put, whether or no it shall be committed? which is either to a committee of the whole house, if it be of importance, or to a private committee, any member naming the persons. The committee being appointed, and a chairman chosen, the chairman reads the bill, paragraph by paragraph, puts every clause to the question, fills up the blanks and makes amendments, according to the opinion of the majority. The bill thus gone through, the chairman makes his report at the side-bar of the house, reads all the additions and amendments, &c. and moves for leave to bring up the report to the table; which granted, he delivers it to the clerk, who reads the amendments, &c.

The speaker then puts the question, whether they shall be read a second time? and if agreed to, he reads them himself. To so many of the amendments as the house acquiesces in, the question is now put, whether the bill, thus amended, shall be ingrossed and written fair upon parchment, and read a third time; and the bill being ingrossed, the speaker holds it in his hand, and asks if it shall pass? If the majority be for it, the clerk writes on it, *Soit baillé aux seigneurs*, let it be delivered to the lords: or, if in the house of lords, *Soit baillé aux communes*, let it be delivered to the commons. If a bill be rejected, it cannot be any more proposed during that session. A bill for a general pardon has but one reading.

When a member of the house of commons speaks, he stands up, uncovered, and directs his speech to the speaker only. If what he says be answered by another, he is not allowed, to reply the same day, unless personal reflections have been cast upon him; but when the commons, in order to have a greater freedom of debate, have resolved themselves into a committee of the whole house, every member may speak to a question as often as he thinks necessary. In the house of lords they vote, beginning at the pious, or lowest baron, and so up orderly to the highest, every one answering *content* or *not content*. In the house of commons they vote by *yeas* and *nays*; and if it be dubious which are the greater number, the house divides.

If the question be about bringing any thing into the house, the *yeas* go out; but if it be about any thing the house already has, the *nays* go out. In all divisions the speaker appoints four tellers, two of each opinion. In a committee of the whole house, they divide by changing sides, the *yeas* taking the right, and the *nays* the left of the chair; and then there are but two tellers. If a bill pass one house, and the other demur to it, a conference is demanded in the painted chamber, where certain members are deputed from each house; and here the lords sit covered, and the commons stand bare, and debate the cause. If they disagree, the affair is null; but if they agree, this, with the other bills that have passed both houses, is brought down to the king in the house of lords, who comes thither clothed in his royal robes; before him the clerk of the parliament reads the title of each bill, and as he reads, the clerk of the crown pronounces the royal assent or dissent. If it be a public bill, the royal assent is given in these words, *Le roy le veut*, the king will have it so; if private, *Soit fait comme il est désiré*, let the request be complied with: if the king refuse the bill, the answer is, *Le roy s'avisera*, the king will consider of it: and if it be a money-bill, the answer is, *Le roy remercie ses loyaux sujets, accepte leur benevolence, & ainsi le veut*; the king thanks his loyal subjects, accepts their benevolence, and therefore grants his consent.

* PARNASSUS, a mountain of ancient Greece, much celebrated by ancient poets. It is near Castro in Livadia, near the ruins of Delphos, and it is remarkable for its two tops, one of which was consecrated to Apollo and the Muses, and the other to Bacchus. It is the highest in Greece. At the foot of this mountain, there rises a spring supposed to be the ancient Castalian spring.

PAROCHIAL, something belonging to a parish.

PARODICAL *Degrees of an Equation*, in algebra, the several regular terms in quadratic, cubic, biquadratic equations, &c. the indexes of whose powers ascend or descend orderly in an arithmetical progression, as $x^3 + x^2m + x = 1$, in a cubical equation, where no term is wanting, but having all its parodic degrees, the indexes of the terms regularly descending thus, 3, 2, 1, 0.

PARODY, a popular maxim, adage, or proverb. Parody is also a poetical plantantry, consisting in applying the

verses

verses written in one subject, by way of ridicule to another; or in turning a serious work into a burlesque, by affecting to observe, as nearly as possible, the same rhymes, words and cadencies.

PAROL, or **PAROLE**, in law, a plea in court: sometimes this word is joined with the term lease; thus lease-parol denotes a lease by word of mouth, in order to distinguish it from a lease in writing.

PARONYCHIA, a whitlow, in surgery, a painful kind of tumour, arising at the ends of the fingers at the roots of the nails.

PAROTIDES, *Parotid Glands*, in anatomy, two large glands behind the ears.

PAROTIDES, in medicine, abscesses, or inflammations of the parotid glands. These tumors are either mild or malignant; they are said to be mild, when they arise spontaneously, without any preceding contagious or pestilential disease, as they frequently do in growing children; and these are generally not dangerous. Of this kind also are those which arise after gentle fevers, being a critical translocation of the disease. Those bubos are called malignant, which happen in the pestilence or venereal disease; whence they are denominated pestilential or venereal bubos.

PAROXYSM, in medicine, the access, or fit of a disease.

* **PARR** (Catherine) queen to Henry VIII. was the daughter of Sir Thomas Parr, of Kendall, Westmoreland, and though a widow, she having before been married to John Neville, lord Latimer, attracted the attention of that monarch. She was celebrated for her learning, and was early educated in polite literature, as was the taste among women of fashion at that time in England. As she advanced in life, she grew fond of studying the Scriptures. Several learned men, who were retained as her chaplains, preached to her every day in her privy-chamber, and frequently touched such abuses as were common in the church. This practice was approved by the king, who often permitted her to confer with him on religious subjects. But when disease and confinement, added to his natural impatience of contradiction, and when in the presence of Winchelsea, and others of his party, she had been urging her old topic of perfecting the reformation, the king, after the retired, broke out into this expression. "A good hearing it is, when

"women become such clerks! and a thing much to my comfort, to come in my old age, to be taught of my wife!" Winchelsea improved the opportunity of aggravating the queen's insolence; and, after insinuating the danger of cherishing such a serpent in his bosom, accused her of treason, cloaked with heresy. The king was indeed prevailed on to give a warrant, to draw up articles that would affect her life, and the day and hour were appointed when she was to be seized. The design, however, being accidentally discovered to her, she waited upon the king, who received her kindly, and began a discourse about religion. She answered, "that women, by their creation at first were made subject to men; and they being made after the image of God, as the women were after their image, ought to instruct their wives, and that she was much more to be taught by his majesty, who was a prince of such excellent learning and wisdom." "Not so," said St. Mary," said the king, "you are become a doctor, Kate, able to instruct us; and not to be instructed by us." To which she replied, "that it seemed he had much mistaken her freedom, in arguing with him, since she did it to engage him in discourse, to amuse this painful time of his infirmity; and that she might receive profit by his learned conversation, in which last point she had not missed of her aim, always referring herself in these matters, as she ought, to his majesty." "And it is even so, sweet heart," said the king, "then we are perfect friends again." The day, which had been appointed for carrying her to the Tower, being very fine, the king took a walk in the garden, and sent for the queen. While they were together, the lord-chancellor, ignorant of the reconciliation, came with the guards. The king stepped aside to him; and after a little conversation, was heard to call him a knave. Ay, arrant knave, a fool, and a beast, and bid him presently gett out of his sight." The queen, being ignorant on what errand they came, and endeavoured, with gentle words, to pacify the king's anger, "Ah! poor soul," said the king, "thou little knowest how ill he deserves this at thy hand. On my word, sweet heart, he has been toward thee, an arrant knave, and so let him go." By her thus happily conquering the king's resentment, she survived

survived him, and at his decease he bequeathed her, as a mark of his affection, a legacy of 4000 l. besides her jointure. She was afterwards married to Sir Thomas Seymour, lord-admiral of England, and uncle to king Edward V. She, however, lived but a very short time, and very unhappily with him; for she died in child-bed; and, not without suspicion of poison. In her time she published, *Prayers or Meditations*, wherein the mind is stirred patiently to suffer all afflictions here, and to set at nought the vain Prosperities of the World, and always long for the everlasting Felicity, in 12mo. And among her papers were found, *Queen Catherine Parr's Lamentation of a Sinner*, bewailing the Ignorance of her blind Life; which was published with a preface, by the great lord Burleigh.

PARRICIDE, *Parricida*, the murder or murderer of a father, as matricide is the murder or murderer of a mother. It is also extended to the murder of any near relation.

PARRYING, in fencing, the action of warding off the blows aimed at one by another.

PARSLEY, in botany, an umbelliferous plant. It is biennial, a native of moist grounds in the southern parts of Europe, and common in our culinary gardens. The roots of parsley are sometimes used in apozems, and supposed to be aperient and diuretic, but liable to produce flatulencies. Their taste is sweetish, accompanied with a slight warmth or flavour, somewhat resembling that of a carrot. The leaves of the plant have a greater warmth and less sweetness than the roots. The seeds, said to be carminative, resolvent, and diuretic, and commended in the German ephemerides for destroying cutaneous insects in children, are in taste warmer and more aromatic than any other part of the plant, and accompanied with a considerable bitterness. Parsley is, by some skilful persons cultivated in fields for the use of sheep, it being a sovereign remedy to preserve them from the rot, provided they are fed twice a week for two or three hours each time with this herb: but hares and rabbits are so fond of it, that they will come from a great distance to feed upon it; and in countries where these animals abound, they will destroy it, if it be not very securely fenced against them; so that whoever chooses to have plenty of hares in their fields, by cultivating parsley, will draw all the hares of

the country to them. The best time for sowing it in the fields is about the middle or latter end of February; the ground should be made fine, and the seeds sown pretty thick, in drills, drawn about a foot asunder, that the ground may be kept hoed between the drills, to destroy the weeds, which, if permitted to grow, will soon over run the parsley. Two bushels of seed will sow an acre of land.

PARSNIP, *passinacha*, in botany, the name of a well-known root. The parsnip is to be propagated by sowing its seeds in February or March, in a rich mellow soil, which must be deep dug, that the roots may be able to run deep without hindrance. It is a common practice to sow carrots, at the same time upon the same ground with the parsnips; and if the carrots are designed to be drawn young, there is no harm in it. The parsnips, when they are grown up a little, must be thinned to a foot distance, and carefully kept clear of weeds. They are finest tasted, just at the season when the leaves are decayed; and such as are desirous to eat them in spring should have them taken up in autumn, and preserved in sand. When the seeds are to be sowed, some very strong and fine plants should be left for it at four feet distance; and towards the end of August, or the beginning of September, the seeds will be ripe; they must then be carefully gathered, and dried on a coarse cloth. They should always be sown the spring following, for they do not keep well. *Miller's Gard. Dict.*

The common wild parsnip is frequent by road sides, and in dry pastures; it flowers in autumn, and ripens its seeds soon after. The seeds deserve to be brought into use in medicine, much more than they are at present. They are warm and carminative, though not so violently hot as the carraway seeds and others, which we commonly use on these occasions. They dispel flatulencies, and are in great esteem among the country people, for curing the colic. They also are diuretic and aperient, and gently promote the menses.

PARSON, the rector, vicar, or incumbent of a parish church.

PARSONAGE, a rectory, or parish church, commonly endowed with a house, glebe, and tithe, for the maintenance of a minister, with cure of souls within such parish.

PART, *Parti*, a portion of some whole.

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whole, considered as actually divided or divisible.

Noble or essential PARTS, in physic, those absolutely necessary to life, as the heart, brain, &c.

Natural or genital PARTS, those ministering to generation.

PART, in geometry and astronomy, is applied to the division of lines and circles, &c.

Proportional PART, a part or number agreeable and analogous to some other part or number; or a medium to find some number or part unknown, by proportion and equality of reason.

Similar PARTS, those which are to one another, as their wholes are to one another.

PART, in music, a piece of the score, or partition, written by itself, for the convenience of the musician; or it is one or more of the succession of sounds, which makes the harmony, written apart. Or, the parts are the sounds made by several persons, singing or playing in concert. Music in parts was unknown to the ancients; they had but one part: all their harmony consisted in the succession of notes, none in the concurrence. There are four principal parts, the treble, bass, tenor, and counter-tenor. Some compare the four parts in music to the four elements; the bass, they say, represents the earth; the tenor, the water; counter-tenor, air: and treble, fire.

PARTS of Speech, in grammar, all the words that enter the composition of a discourse, as noun, pronoun, verb, participle, adverb, conjunction, preposition, and interjection.

* *PARTHENOPE*, in fabulous history, one of the Syrens, who, being to charm Ulysses and his companions with their songs, threw themselves into the sea. The poets say, that Parthenope landed in Italy, and died there. That a city was built at her tomb, from which her name was called Parthenope, now Naples.

PARTERRE, in gardening, a level division of ground which usually faces the south, and best front of an house; and is generally furnished with greens, flowers, &c. There are several sorts of parterres, as plain grass with borders, and parterres of embroidery, &c. Plain parterres are more beautiful in England than in any other country, by reason of the excellency of our turf, and that decency and unaffected simplicity that it

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affords to the eye of the spectators. Other parterres are cut into shell and scroll-work, with sand-alleys between them; which sort of parterres are esteemed finest in France. As to the general proportions of parterres, an oblong or long square is esteemed the best: therefore a parterre should not be less than twice as long as it is broad: twice and a half is accounted a very good proportion; and it is very rare that three times is exceeded.

PARTI, PARTIE, PARTY, or *PARTED*, in heraldry, is applied to a shield or escutcheon, denoting it divided or marked out into partitions.

PARTICIPATION, that which gives a part or share in any thing, either by right or favour.

PARTICIPLE, Participium, in grammar, an adjective formed of a verb, so called because it participates partly of the properties of a noun, and partly of those of a verb; being variable through genders and cases, like the former; and regarding time, action, passion, &c. in manner of the latter.

PARTICLE, in physiology, the minute part of a body, an assemblage of which constitute all natural bodies. It is the various arrangement and texture of these particles, with the difference of cohesion, &c. that constitute the various kinds of bodies. By this attraction of the particles, Sir Isaac Newton shews, that most of the phenomena of the lesser bodies are affected, as those of the heavenly bodies are, by the attraction of gravity. See *Attraction* and *Gravitation*.

PARTICLES, in grammar, a denomination comprizing adverbs, prepositions, interjections, and conjunctions. Mr. Locke observes, that it is in the right use of particles, the clearness and beauty of a good style more particularly consists.

PARTICULAR, Particularis, a relative term referring to species or individual, and opposed to general or universal.

PARTIES, in law, signify the persons that are named in a deed or fine, viz. those that made the deed, or levied the fine, and also those to whom the same was made or levied.

PARTNER and *PARTNERSHIP*. See *Fellowship*.

PARTRIDGE, in ornithology, a species of tetrao, with a naked scarlet mark behind the eyes. The common partridge is too well known to need a farther

father description: it is common in fields, and called by authors perdix. But besides the common kind, there is another somewhat larger species called the red-legged partridge, with a grey tail, variegated in the upper part with brown.

PARTY, in politics, a faction considered as opposing another. In law, party-jury is one impanelled in actions brought for or against foreigners.

PARULIDES, in surgery, tumours and inflammations of the gums, commonly called gum-boils.

PASQUIN, a mutilated marble statue at Rome, in a corner of the palace of the Ursini: it takes its name from a cobbler of that city called Pasquin, famous for his sneers and gibes, and who diverted himself with passing his jokes on every one who went through the street. After his death, as they were digging up the pavement before his shop, they found in the earth the statue of an ancient gladiator, well executed, but maimed, and half spoiled: this they set up in the place where it was found, and by common consent named it Pasquin. Since that time all satires are attributed to that figure, and are either put into its mouth or passed upon it, as if they were wrote by Pasquin redivivus; and these are addressed by Pasquin to Marforio, another statue at Rome. When Marforio is attacked, Pasquin comes to his assistance; and when Pasquin is attacked, Marforio assists him in his turn.

PASQUINADE, a satirical libel fastened to the statue of Pasquin: these are commonly short, merry, and epigrammatic; and from hence the term has been applied to all lampoons of the same cast. The difference between a pasquinade and a satire is, that the end of the latter is to correct and reform, while that of the former is only to ridicule and expose.

PASS, a straight, difficult, and narrow passage, which shuts up the entrance into a country.

Birds of PASSAGE, those birds which at certain stated seasons of the year remove from certain countries, and at other stated times return to them again, as our quails, woodcocks, storks, nightingales, swallows, and many other species.

Right of PASSAGE, in commerce, an imposition or duty exacted by some princes, either by land or sea, in certain close and narrow places in their territories, on all vessels and carriages, and

even sometimes on persons or passengers coming in or going out of ports, &c.

PASSANT, in heraldry, a term applied to a lion, or other animal, in a shield, appearing to walk leisurely: for most beasts, except lions, the term trippant is frequently used instead of passant.

PASSIONS, in moral philosophy, certain motions of the soul, which make it pursue what appears to be good, and avoid whatever threatens evil.

PASSIONS, in medicine, make one of the non-naturals, and produce very sensible effects. Joy, anger, and fear, are the principal. In the two first, the spirits are hurried with too great vivacity; whereas, in fear or dread, they are as it were curbed and concentrated: whence we may conclude, that they have a very bad effect upon health; and therefore it will be best to keep them within bounds as much as possible, and to preserve an inward serenity, calmness, and tranquillity. Continual sorrow and anguish of mind render the fluids thick, and generate viscid and acid crudities in the stomach, and at length render the body unapt for a due circulation; whence proceed obstructions of the viscera, and many chronical disorders. Anger constricts the bilious vessels in particular, and causes too great an evacuation of the bile; produces strictures in the stomach and duodenum; whence the bilious humours are amassed and corrupted; laying a foundation for vomiting, bilious fevers, and cardialgiæ.

PASSIONS, in painting, the external expressions of the different dispositions and affections of the mind; but particularly their different effects upon the several features of the face; for though the arms, and indeed every part of the body, serve likewise, by their quick, languid, and variously diversified motions, to express the passions of the soul: yet, in painting, this difference is most conspicuous in the face. In sorrow, joy, love, shame, and compassion, the eyes swell all of a sudden, are covered with a superabundant moisture, and drop tears; and in grief especially, the corners of the mouth hang down, the eye-lids are half shut, and the pupil of the eye is elevated and half covered; and all the other muscles of the face are relaxed, so that the visage appears longer than ordinary. In fear, terror, fright, and horror, the eye-brows are greatly elevated, the eye-lids are expanded as wide as possible, so as

to discover the white of the eye, and the pupil is depressed and half covered by the lower eye-lid; the hair stands an end; the mouth is at the same time wide open, and the lips so far drawn back, that the teeth both of the upper and under jaw appear.

Contempt is expressed by raising one side of the upper-lip, so as to discover the teeth, whilst the other side has a movement like that in laughter; the eye, on that side where the teeth appear, is half shut, whilst the other remains open; however, both the pupils are depressed.

In jealousy, envy, hatred, and malice, the eye-brows are knit; and, in laughter, all the parts agree, tending as it were towards the center of the face.

Mr. le Brun has been extremely happy in expressing the several passions, and the examples he has left of them deserve imitation.

PASSIONS, in poetry, are of singular use in distinguishing the characters of the actors. See *Character*.

PASSION-FLOWER, *Passiflora*, in botany, a genus of plants. There are several sorts of this plant, but that which is the most commonly cultivated is the *passiflora foliis palmatis integrimis*, passion-flower with hard sharpened entire leaves, or the common passion-flower. This grows naturally in the Brasils, yet is hardy enough to thrive in the open air here; and is seldom injured except in very severe winters, which commonly kill the branches to the ground, and sometimes destroys the roots: this rises in a few years to a great height, if they have proper support. I have seen, says Mr. Miller, some of these plants, whose branches were trained up more than forty feet high. The stalks will grow almost as large as a man's arm, and are covered with a purplish bark, but do not become very woody. The shoots from these stalks are often twelve or fifteen feet long in one summer; they are very slender, so must be supported, otherwise they will hang to the ground, intermix with each other, and appear very unightly. This plant begins to flower early in July, and there is a succession of flowers daily, till the frost in autumn puts a stop to them.

It may be propagated by seeds, which should be sown upon a moderate hot-bed, which will bring up the plants much sooner than when they are sown in the open air, so they will have more time to get strength before winter.

It may be also propagated by laying down the branches, which in one year will be well rooted, so may be taken off from the old plants and transplanted where they are designed to remain. The cuttings of this will also take root, if they are planted in a loamy soil not too stiff, in the spring before they begin to shoot. If these are covered with bell or hand-glasses to exclude the air, they will succeed much better than when they are otherwise treated; but when the cuttings put out shoots, the air should be admitted to them, otherwise they will draw up weak, and spoil: they must be afterwards treated as the layers.

Those plants, which are propagated by layers or cuttings, do not produce fruit so plentifully as the seedling plants; and I have found the plants which have been propagated two or three times, either by layers or cuttings, seldom produce fruit, which is common to many other plants. *Miller's Gard. Diet.*

PASSION-WEEK, the week next preceding the festival of Easter; so called, because in that week our Saviour's passion and death happened.

PASSIVE, in general, denotes something that suffers the action of another, called an agent, or active power. In grammar, the verb or word that expresses this passion, is termed a passive verb; which, in the learned languages, has a peculiar termination, as *amor, doctor, &c.* in Latin; that is, an *r* is added to the actives *amo, doceo*: and, in the Greek, the inflection is made by changing *ω* into *ομαι*, as *τιμω, τιμωμαι, &c.* But, in the modern languages, the passive inflection is performed by means of auxiliary verbs, joined to the participle passive; as *I am praised*, in Latin *laudor*, and in Greek *επαίνετομαι*; or, *I am loved*, in Latin *amor*, and in Greek *φιλομαι*. Thus it appears, that the auxiliary verb *I am*, serves to form the passives of English verbs; and the same holds of the French, as *je suis loué*, *I am praised*; *j'ai été loué*, *I have been praised, &c.*

PASSOVER, a solemn festival of the Jews, celebrated on the fourteenth day of the month next after the vernal equinox, and instituted in commemoration of their coming out of Egypt; because on the night before their departure the destroying angel, who put to death the first-born of the Egyptians, passed over the houses of the Hebrews, which were sprinkled with the blood of a lamb. The whole transaction is related in the twelfth chapter

chapter of Exodus. They were ordered before this festival to kill the paschal lamb, and to sprinkle their door-posts with its blood; and the following night, which was the grand feast of the passover, and which was to continue seven days, they were to eat the lamb roasted with a salad of wild lettuces, or other bitter herbs, in the posture of travellers; and if any part remained the day following, it was to be thrown into the fire; and for eight days together no leavened bread was to be used, on pain of being cut off from the people.

PASS-PAROLE, a command given at the head of an army, and thence communicated to the rear by passing it from mouth to mouth.

PASS-PORT, or **PASS**, a licence, or writing obtained from a prince or governor, granting liberty and safe-conduct to pass through his territories without molestation.

PASTEEBOARD, a kind of thick paper formed of several sheets of paper pasted together.

PASTE, a composition of water and flour, boiled to a consistence, used by various artificers, upholsterers, bookbinders, &c. In cookery, paste is the composition of flour, &c. wherein pies are baked; and in confectionary, paste denotes a preparation of some fruit, made by beating the pulp thereof with some fluid, or other admixture; and afterwards drying it with sugar, till as pliable as common paste.

PASTE, in the glass-trade, a kind of coloured glass, made of a calcined crystal, lead, and metallic preparations, so as to imitate the natural gems: for the manner of effecting which, see *Gem*.

PASTERN of a horse, in the manage, the distance between the joint next the foot, and the coronet of the hoof. This part should be short, especially in middle-sized horses, because long pasterns are weak, and cannot so well endure travelling.

PASTERN-JOINT, the joint next a horse's foot.

PASTIL, or **PASTEL**, among painters, a kind of paste made of different colours, ground up with gum-water, in order to make crayons. See *Crayon*.

Sometimes the crayons themselves are called pastils.

PASTOR, a shepherd, but is now generally used for a parson or minister that hath cure of souls.

PASTORAL, something relating to

shepherds; hence we say, pastoral life, manners, poetry, &c. The original of poetry is ascribed to that age which succeeded the creation of the world: and as the keeping of flocks seems to have been the first employment of mankind, the most ancient sort of poetry was, probably, pastoral. It is natural to imagine, that the leisure of those ancient shepherds admitting and inviting some diversion, none was so proper to that solitary and sedentary life as singing; and that in their songs they took occasion to celebrate their own felicity. From hence a poem was invented, and afterwards improved to a perfect image of that happy time; which, by giving us an esteem for the virtues of a former age, might recommend them to the present. And since the life of shepherds was attended with more tranquillity than any other rural employment, the poets chose to introduce their persons, from whom it received the name of pastoral.

A pastoral is an imitation of the action of a shepherd, or one considered under that character. The form of this imitation is dramatic, or narrative, or mixed with both; the fable simple; the manners not too polite nor too rustic; the thoughts are plain, yet admit a little quickness and passion, but that short and flowing; the expression humble, yet as pure as the language will afford; neat, but not florid; easy, and yet lively. In short, the fable, manners, thoughts, and expressions are full of the greatest simplicity in nature. The complete character of this poem consists in simplicity, brevity, and delicacy; the two first of which render an eclogue natural, and the last delightful.

If we would copy nature, it may be useful to take this idea along with us, that pastoral is an image of what they call the golden age. So that we are no to describe our shepherds, as shepherds at this day really are, but as they may be conceived then to have been, when the best of men followed the employment. To carry this resemblance yet farther, it would not be amiss to give these shepherds some skill in astronomy, as far as it may be useful to that sort of life. And an air of piety to the gods should shine through the poem, which so visibly appears in all the works of antiquity: and it ought to preserve some relish of the old way of writing; the connection should be loose, the narrations and description short, and the periods concise. Yet it is not sufficient

cient that the sentences only be brief, the whole eclogue should be so too. For we cannot suppose poetry, in those days, to have been the business of men, but their recreation at vacant hours.

But with respect to the present age, nothing more conduces to make these compositions natural, than when some knowledge in rural affairs is discovered. This may be made to appear rather done by chance than by design, and sometimes is best shewn by inference; lest, by too much study to seem natural, we destroy that easy simplicity from whence arises the delight. For what is inviting in this sort of poetry proceeds not so much from the idea of that business, as of the tranquillity of a country life.

We must, therefore, use some illusion to render a pastoral delightful; and this consists in exposing the best side only of a shepherd's life, and in concealing its miseries. Nor is it enough to introduce shepherds discoursing together in a natural way, but a regard must be had to the subject, that it contain some particular beauty in itself, and that it be different in every eclogue. Besides, in each of them, a designed scene or prospect is to be presented to our view, which should likewise have its variety. This variety is obtained, in a great degree, by frequent comparisons, drawn from the most agreeable objects of the country; by interrogations to things inanimate; by beautiful digressions, but those short; sometimes by insisting a little on circumstances; and, lastly, by elegant turns on the words, which renders the numbers extremely sweet and pleasing. As for the numbers themselves, though they are properly of the heroic measure, they should be the smoothest, the most easy and flowing imaginable. It is by rules like these we ought to judge a pastoral. And since the instructions given for any art are to be delivered as that art is in perfection, they must in necessity be derived from those in whom it is acknowledged so to be. It is, therefore, from the practice of Theocritus and Virgil, the only undisputed authors of pastoral, that the critics have drawn the foregoing notions concerning it.

Theocritus excels all others in nature and simplicity. The subjects of his Idyllia are purely pastoral; but he is not so exact in his persons, having introduced reapers and fishermen, as well as shepherds. He is apt to be too long in his descriptions, of which that of the cup,

in the first pastoral, is a remarkable instance. In the manners he seems a little defective, for his swains are sometimes abusive and immodest, and, perhaps, too much inclining to rusticity; for instance, in his fourth and fifth Idyllia. But it is enough that all others learned their excellencies from him, and that his dialect alone has a secret charm in it, which no other could ever attain.

Virgil, who copies Theocritus, refines upon his original; and in all points where judgment is principally concerned, he is much superior to his master. Tho' some of his subjects are not pastoral in themselves, but only seem to be such, they have a wonderful variety in them, which the Greek was a stranger to. He exceeds him in regularity and brevity, and falls short of him in nothing but simplicity and propriety of style; the first of which perhaps was the fault of his age, and the last of his language.

Among the moderns, their success has been greatest, who have most endeavoured to make these ancients their pattern. The most considerable genius appears in the famous Tasso and our Spencer. Tasso, in his *Aminta*, has as far excelled all the pastoral writers, as in his *Gierusalemme* he has out-done the epic poets of his country. But as this piece seems to have been the original of a new sort of poem, the pastoral comedy in Italy, it cannot so well be considered as a copy of the ancients. Spencer's *Calendar*, in Mr. Dryden's opinion, is the most complete work of this kind which any nation has produced ever since the time of Virgil. Not but that he may be thought imperfect in some few points. His eclogues are somewhat too long, if we compare them with the ancients. He is, sometimes too allegorical, and treats on matters of religion in a pastoral style, as the Mantuan had done before him. He has employed the lyric measure, which is contrary to the practice of the old poets. His stanza is not always the same, nor always well chosen; the last may be the reason why his expression is sometimes not concise enough: for the tetrastrich has obliged him to extend his sense to the length of four lines, which would have been more closely confined in the couplet.

In the manners, thoughts, and characters, he comes near to Theocritus himself; though, notwithstanding all the care he has taken, he is certainly inferior in his dialect: for the Doric had its beauty

beauty and propriety in the time of Theocritus, it was used in part of Greece, and frequent in the mouths of many of the greatest persons; whereas the whole English and country phrases of Spencer were either entirely obsolete, or spoken only by people of the lowest condition. As there is a difference between simplicity and rusticity, so the expression of simple thoughts should be plain but not clownish. The addition he has made of a calendar to his eclogues is very beautiful, since by this, besides the general moral of innocence and simplicity, which is common to other authors of pastoral, he has one peculiar to himself; he compares human life to the several seasons, and at once exposes to his readers a view of the great and little worlds, in their various changes and aspects. Yet the scrupulous division of the pastorals into months has obliged him either to repeat the same description in other words, for three months together, or, when it was exhausted before, entirely to omit it: whence it comes to pass, that some of his eclogues, as the 6th, 8th, and 10th, for example, have nothing but their titles to distinguish them. The reason is evident; because the year has not that variety in it to furnish every month with a particular description, as it may every season. Respecting the modern pastoral poets, Mr. Pope and Mr. Philips stand among the foremost. I shall not draw a comparison between the pastorals of Mr. Pope and Mr. Philips, for that has been already done by Mr. Pope himself. Mr. Shenstone has also hit upon the true nature of pastoral compositions.

PASTORAL STAFF, the same with crozier. See *Crozier*.

PASTURE, or **PASTURE-LAND**, that reserved for feeding cattle. Pasture-land is of such advantage to husbandry, that many prefer it even to corn-land, because of the small hazard and labour that attends it, and as it lays the foundation for most of the profit that is expected from the arable land, because of the manure the cattle afford which are fed upon it. Where dung is not to be bought, as is often the case in places distant from large towns, the farmer is forced to proportion his arable to his pasture land, in such manner that the cattle fed on the latter may be sufficient for a supply of dung, so necessary for producing the fruits of the former. Pasture-lands are of three kinds: 1. The uplands; these lie so high as not to be over-

flowed by rivers, or land-floods. 2. Those low lands which lie near rivers and fens. And, 3. Those that lie near the sea. All dung that is laid on pasture-land must be laid on in winter, that the rains may wash its fatness into the ground before the sun scorches it, or evaporates its goodness. Fine mould mixed with the dung, and spread with it over the land, is very good for pastures; for it is washed down to the very roots of the grass, and gives them a new and fine soil just in those places where it is most wanted. The best manure for pasture-land is the rotten bottoms of old haystacks; for these moulder away into a very rich soil, and are always full of vast quantities of seed, fallen at times from the hay, which all grow when spread on the ground: and thus new nourishment, and a new set of plants, are given at once to the exhausted ground. But as particularly useful as this is for pasture-ground, it is as improper for corn-land, and should by no means ever be suffered to mix with the manure for those grounds; as it will then raise grass and other plants, which though of use in the pasture, are weeds among the corn.

PASTURE of Plants, a term used by Tull, for the nourishment they draw from the earth.

PASTY, in cookery, a preparation of venison, veal, lamb, or other meat; which being boned, beaten to a pulp, and highly seasoned, is inclosed in a proper paste, and baked in an oven.

PATE, or **PATTEE**, in heraldry, a cross small in the center, and widening to the extremes, which are very broad.

PATELLA, in anatomy, a bone which covers the fore part of the joint of the knee, called also rotula, and popularly the knee-pan.

PATELLA, the **LIMPET**, a genus of shell-fish, with a simple shell, of a conic or other gibbous figure, and a very wide opening at the mouth or bottom; always applying itself firmly to some solid body, which serves it instead of another shell. The animal inhabiting it is called limax.

PATENT, in general, denotes something that stands open or expanded: thus a leaf is said to be patent when it stands almost at right angles with the stalk.

PATENT, OF LETTERS-PATENT. See *Letter*.

PATENTEE, one to whom the king has granted his letters-patent.

PATER-NOSTER, the Lord's prayer.

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so called from the two first words thereof in Latin. It is also sometimes used for a chaplet or string of beads. And, in architecture, the same term is used for a sort of ornament cut in the form of beads, either oval or round, used on astragals, baguettes, &c.

PATH, denotes the course or tract marked out or run over by a body in motion.

PATHETIC, whatever relates to the passions, or that is proper to excite or awake them. In music, this term is used for something very moving, expressive, or passionate, and is capable of exciting pity, compassion, anger, or the like.

PATHETIC NERVES, in anatomy, a pair of very small nerves which arise in the brain, and run to the trochlear muscle of the eye. These nerves have obtained the name pathetic, from their serving to move the eyes in the various passions.

PATHOGNOMONIC, among physicians, an appellation for a symptom, or concurrence of symptoms, that are inseparable from a distemper, and are found in that only, and in no other.

PATHOLOGY, that part of medicine which explains the nature of diseases, their causes and symptoms.

PATHOS, *πάθος*, a Greek term, literally signifying passion, is sometimes used for the energy of a discourse, or its power to move the passions.

PATIENT, among physicians, a person under the direction of a physician or surgeon, in order to be cured of some disease.

PATRIARCHS, among Christians, ecclesiastical dignitaries, or bishops, so called from their paternal authority in the church.

PATRIARCHAL CROSS, in heraldry, that where the shaft is twice crossed; the lower arms being longer than the upper ones.

PATRICIAN, among the ancient Romans, a title given to the descendants of the hundred, or, according to others, of the two hundred first senators chosen by Romulus, and by him called *patres*, fathers.

PATRIMONY, a right or estate inherited by a person from his ancestors.

PATROL, in war, a round or march made by the guards, or watch, in the night-time, to observe what passes in the streets, and to secure the peace and tranquillity of a city or camp. The patrol generally consists of a body of five or six

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men, detached from a body on guard, and commanded by a serjeant.

PATRON, among the Romans, an appellation given to a master who had freed his slave.

Patron was also a name which the people of Rome gave to some great man, under whose protection they usually put themselves.

PATRON, in the church of Rome, a saint whose name a person bears, or under whose protection he is put, and whom he takes particular care to invoke. Patron is also a name given to those great men who protect or countenance an author, and permit him to dedicate his literary performances to him.

PATRON, in the canon and common law, a person, who having the advowson of a parsonage, vicarage, or the like spiritual promotion, belonging to his manor, hath, on that account, the gift and disposition of the benefice, and may present to it whenever it becomes vacant.

PATRONAGE, the right of disposing of a church or benefice, and enjoying several other privileges, such as having the honourable rights of the church, being interred in the chancel, &c.

PATRONYMIC, among grammarians, is applied to such names of men and women as are derived from those of their parents or ancestors.

PAVEMENT, a layer of stone, or other matter, serving to cover and strengthen the ground for the more commodious walking on.

PAVILLION, in architecture, a kind of turret or building, usually insulated, and contained under a single roof; sometimes square, and sometimes in form of a dome: thus called from the resemblance of its roof to a tent.

PAVILLION, in military affairs, a tent raised on posts to lodge under in the summer-time.

PAVO, in astronomy, a southern constellation, called the peacock.

PAUSE, a stop or cessation of speaking, singing, playing, or the like. The use of pointing in grammar, is to make proper pauses in certain places. There is a pause in the middle of each verse; in an hemistich it is called a rest or repose.

PAUSE, in music, a character of silence, or rest, called also by some a mute figure, because it shews that some part or person is to be silent, while the rest continue the song.

PAYMENT, the discharge of a debt, either

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either by cash, or by bills of exchange, &c

PEACE, *Pax*, in its general signification, stands in contradistinction to war.

PEACE, in our law-books, signifies a quiet and inoffensive behaviour towards the king and his people. It is observed, that all authority for keeping the peace comes originally from the king, who is the supreme officer or magistrate for the preservation of it. Also the lord chancellor, and judges of the king's bench, &c. have a general power to keep the peace over all the realm; as have likewise all courts of record within their own precincts, and sheriffs of counties, justices of the peace, constables, &c. No person may break the peace without being liable to punishment; and where any person is in danger of harm, or some bodily prejudice from another, on oath made thereof before a justice of the peace, or other magistrate, he may be secured by bond or recognizance, which is commonly called binding to the peace.

PEACE of the King, that peace or security, both of life and goods, which the king promises to all his subjects, or others that are under his protection. There is also the peace of the king's highways, which is to be free from all annoyances and molestation; to which may be added the peace of the plough, whereby both the plough and plough-cattle are secured from distresses; and fairs are said to have their peace, so that no person may be troubled there for debts contracted elsewhere.

PEACH, *Persica*, in botany, the name of a genus of trees.

The fineness of this fruit, in general, depends on the firmness of the pulp, the delicacy of the flavour, and the thinness of the skin. A fine peach should be of a fine deep red next the sun, and of a pale whitish hue next the wall; and the pulp should be of a yellow cast, and very juicy; and the stone should be small, though the fruit in general be large.

The best method of saving the stones is, says Mr. Miller; to let some of the finest peaches of the best kinds hang till they drop off themselves from the tree; and then the stones should be immediately planted on a bed of light rich earth, planting them four inches deep in the earth, and at about four inches asunder. The beds should be covered, to preserve them in winter; and in spring when the trees come up, they must be cleared of weeds, and well watered. The next

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spring they should be carefully taken up, and planted in the nursery at greater distances: and, after two or three years standing here, they may be removed to the places where they are to remain; or may at that time, when the condition of their fruit is known, be grafted on other stocks, which is the common way now used to propagate these trees.

The common method of propagating the peach is, by grafting. In order to this, some good stocks should be provided, which should be of the muscle, or a white pear plum. When these stocks are two or three years old, they will be strong enough to bud; and the common season for doing this is about Midsummer. The buds should be chosen from a healthy tree, which produces a great deal of fruit; they must be taken from the trees either in a cloudy day, or else in the morning or evening, when the sun has not much power; they should then be inoculated on the stalks as soon as possible, and the stalks treated with the usual care afterwards. See *Inoculation*.

When these are to be transplanted where they are to remain, the most proper soil for them is a light rich pasture-land, taken up with the turf, and rotted together, before it is to be used; and the borders to be made with this cannot be too wide, and ought to be raised five or six inches above the level of the ground; or, if the soil be moist, more than that. They must be transplanted in autumn, as soon as the leaves are fallen off; and should never be set at less than fourteen feet distance from one another. The heads of the trees are then to be raised up against the walls, to keep the roots from being moved by the winds; and they should be watered at times, with a noise on the watering pot, and the water sprinkled all over them. In the middle of May the new shoots are to be nailed to the wall, training them horizontally; and the foreright shoots are to be rubbed off: in October the new branches should be pruned, shortening them according to the strength of the tree; if strong, they may be left eight inches long; if weak, they should only be left five; and the same care is to be taken of them for the succeeding years.

There are two general rules always to be observed in the pruning of peach and nectarine trees, which are, 1. Always to have enough bearing wood. 2. Not to lay in the branches too close to one another. All peach-trees produce their fruit from

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from the young wood, either of the same, or, at the most, of the former year's shoot; for this reason the branches are to be so pruned, as to encourage them to throw out new shoots in every part of the tree: and this is to be done in May, when, by pinching, or stopping the strong shoots, there may be new wood forced out in any part of the tree. This is the method of the summer pruning; the winter pruning is usually done in February or March, but it is much better done at Michaelmas, as soon as their leaves begin to fall; and the wounds will then have time to heal before the severe frosts come on.

In pruning of these trees it must always be observed also, that it is best done under a wood bud, not a blossom bud; which may be distinguished by the wood buds being less turgid, and longer, and narrower than the blossom bud; for, if the shoot have not a leading bud where it is cut, it will commonly die down to the leading bud. In nailing the shoots to the wall, they should be placed at as equal distances as possible, and to far apart, that the leaves may have room; and they must always be trained as horizontally as possible, that the lower part of the tree may be well wooded, which it will not be, if the branches are suffered to run upright.

Miller's Gardener's Dictionary.

PEACOCK, *Pavo*, in ornithology, a genus of birds, of the order of the gallinae; the characters of which are these: there are four toes on each foot, and the head is ornamented with an erect crest of feathers. Of this genus there are several species, distinguished by their different colours. The male of the common kind is, perhaps, the most gaudy of all the bird kind; the length and beauty of whose tail, and the various forms in which the creature carries it, are sufficiently known and admired.

PEAK, a rocky mountainous country in the west of Derbyshire, remarkable for its mines of lead and iron, &c.

PEAR, *Pyrus*, in botany. All the sorts of pears, propagated in gardens, are produced by budding, or grafting them upon stocks of their own kind, which are commonly called tree-stocks, or else upon the quince or white-thorn stocks: but the last are now generally disused, the fruit produced this way being apt to be dry and meaty. The quince stocks are, however, in great esteem for the trees designed for dwarfs or for walls; because they do not let the shoots grow so fast and luxuriant. But there are objections against

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even these, which are of some consequence; for there are many kinds of pear which will not do upon them, but will die, or become weak and good for nothing, after three or four years; and the hard-baking pears are rendered very unpleasant by being grafted on these stocks, while the buttery or melting ones are meliorated by them. And it is to be added, that no sort of pear will thrive upon a quince stock in a poor or gravelly soil.

PEAR TREES planted either against walls, or in espaliers, must not be placed nearer to one another than twenty feet. Pear-trees commonly produce their blossom buds first, at the extremity of their last year's shoots; the common way of pruning is very prejudicial, therefore, as it takes off the part which should bear the fruit, and occasions new shoots from the same branch, which will over fill the tree with wood, the trees should always be carefully looked over in summer; and all the forefront shoots taken off; by which means the fruit will not be over-shaded, and the trees will need but little winter pruning. The several sorts of summer pears all ripen best in espaliers, but the winter pears require a south-east, or south-west, or else an east wall.

Miller's Gard. Diet.

PEARCH-GLUE, a kind of glue of remarkable strength and purity, made from the skins of perch.

PEARL, *Margarita*, in natural history, a hard, white, shining body, usually roundish, found in a testaceous fish resembling an oyster. Pearls, though esteemed of the number of gems, and highly valued, not only at this time, but in all ages, proceed only from a distemper in the creature that produces them, analogous to the bezoars, and other stony concretions in several animals of other kinds; and what the ancients imagined to be a drop of dew concentered into a pearl in the body of the pearl-fish, which they supposed rose from the bottom to the surface of the water to receive it, is nothing more than the matter destined to form and enlarge the shell, bursting from the vessels destined to carry it to the parts of the shell it should have formed, and by that means producing these little concretions.

The fish in which these are usually produced is the East Indian pearl oyster, as it is commonly, though not very properly, called: it has a very large and broad shell of the bivalve kind, sometimes measuring twelve or fourteen inches

over,

over, but those of eight inches are more frequent: it is not very deep; on the outside it is of a dusky brown, and within of a very beautiful white, with tinges of several other colours, as exposed in different directions to the light. Besides this shell, there are many others that are found to produce pearls; as the common oyster, the muscle, the pinna marina, and several others, the pearls of which are often very good; but those of the true Indian berberi, or pearl oyster, are in general superior to all. The small or seed pearls, are also called ounce pearls, from their being sold by the ounce, and not by tale, are vastly the most numerous and common; but, as in diamonds, among the multitude of small ones, there are smaller numbers of larger found, so in pearls there are larger and larger kinds; but as they increase in size, they are proportionably less frequent, and this is one reason of their great price. We have Scotch pearls frequently as big as a little tare, some as big as a large pea, and some few of the size of a horse-bean; but these are usually of a bad shape, and of little value in proportion to their weight. Philip II. of Spain had a pearl perfect in its shape and colour, and of the size of a pigeon's egg. De Boot tells us of one in the emperor Rodolph's possession, of thirty carats weight; Tavernier mentions one in Persia, for which that crown paid to the amount of more than a hundred thousand pounds sterling; and we are told of Cleopatra's possessing one worth fourscore thousand pounds of our money; pearls of such vast sizes as these are as rare as the great diamonds; but, as among diamonds, there are a considerable number, which though very short of this, are of great value. The finest and what is called the true shape of the pearl, is a perfect round; but if pearls of a considerable size are of the shape of a pear, as is not unfrequently the case, they are not less valued, as they serve for earrings and other ornaments. Their colour ought to be a pure white, and that not a dead and lifeless, but a clear and brilliant one; they must be perfectly free from any foulness, spot, or stain, and their surfaces must be naturally smooth and glossy, for they bring their natural polish with them, which art is not able to improve.

This valuable article of commerce is not the product of any peculiar part of the world. The East-Indies and America produce the pearl shell-fish in abundance, and it is found with good pearls in many

parts of Europe. The coasts of the island Ceylon afford pearls superior to those of all the East in the beauty of their colour, but there are no very large ones found there. The Persian gulph abounds with the pearl-fish, and fisheries are established on the coast of the several islands in it. In America, there are fisheries in the gulph of Mexico, and along the coast of Terra Firma, all which yield considerable advantage. The European pearls are principally found on the coasts of Scotland, and the neighbouring parts. The pearls met with in apothecaries shops are of various kinds, all that are unfit for the jewellers purposes coming thither; consequently some of the rough and ill shaped pearls, and those of bad colours, are at times to be met with there; though the generality are what are only too small for working into toys, &c. These, after levigation, make an impalpable powder, which is much talked of as an ingredient in what is called pearl-cordials; but most of the apothecaries use only levigated oyster-shell under its name.

Manner of fishing for PEARLS in the East-Indies. There are two seasons for pearl-fishing, the first is in March and April, and the last in August and September; and the more rain there falls in the year, the more plentiful are these fisheries. At the beginning of the season there are sometimes two hundred and fifty barks on the banks; the larger barks having two divers, and the smaller one. Each bark puts off from the shore at sun-rise, with a land-breeze, which never fails; and returns again by a sea-breeze, which succeeds it about noon. As soon as the barks arrive at the place where the fish lie, and have cast anchor, each diver binds a stone six inches thick, and a foot long, under his body; which serves him as ballast, prevents his being driven away by the motion of the water, and enables him to walk more steadily under the waves. They also tie another very heavy stone to one foot, by which they are speedily sunk to the bottom of the sea: and as the oysters are usually firmly fastened to the rocks, they arm their hands with leathern mittens to prevent their being wounded in pulling them violently off; but this task some perform with an iron-rake. In the last place, each diver carries down with him a large net in the manner of a sack, tied to his neck by a long cord, the other end of which is fastened to the side of the bark. This net is to hold the oysters gathered from

the rock, and the cord is to pull up the diver when his bag is full, or he wants air. See *Diving*.

In this equipage he sometimes precipitates himself sixty feet under water; and as he has no time to lose, he no sooner arrives at the bottom, than he begins to run from side to side, tearing up all the oysters he meets with, and cramming them into his bag.

At whatever depth the divers are, the light is so great that they easily see whatever passes in the sea: and to their great consternation sometimes perceive monstrous fishes from which all their address in muddying the water, &c. will not always save them, but they unhappily become their prey: and of all the dangers of the fishery, this is one of the greatest and most usual. The best divers will keep under water near half an hour, and the rest do not stay less than a quarter. During this time they hold their breath without the use of oils, or any other liquors; only acquiring the habit by long practice. When they find themselves straitened, they pull the rope to which the bag is fastened, and hold fast by it with both hands; when those in the bark, taking the signal, heave them up into the air, and unload them of their fish, which is sometimes five hundred oysters, and sometimes not above fifty. Some of the divers need a moment's respite to recover breath; others jump in again instantly, continuing this violent exercise without intermission for several hours.

Manner of fishing for PEARLS in America. The first to whom the Indians made this valuable discovery, was Basco Nunez de Balboa, who in his passage for making further discoveries on the South-sea, was presented with some pearls by Tumaco, an Indian prince. At present they are found in such plenty, that there are few persons of substance near Panama, who do not employ all, or, at least, part of their slaves in this fishery, the manner of which not being commonly known, it will not be improper to describe it here.

The owners of the negroes employ the most proper persons for this fishery, which being performed at the bottom of the sea, they must be both expert swimmers, and capable of holding their breath a long time. These they send to the islands, where they have huts built for their lodgings, and boats which hold eight, ten, or twenty negroes under the command of

an officer. In these boats they go to such parts as are known to produce pearls, and where the depth of the water is not above ten, twelve, or fifteen fathoms. Here they come to an anchor, and the negroes having a rope fastened round their bodies, and the other end to the side of the boat, they take with them a small weight to accelerate their sinking, and plunge into the water. On reaching the bottom they take up an oyster, which they put under the left arm; the second they hold in their left hand, and the third in their right; with these three oysters, and sometimes another in their mouth, they rise to breathe, and put them in a bag. When they have rested themselves a while and recovered their breath, they dive a second time; and thus continue, till they have either completed their task, or their strength fails them. Every one of these negro divers is obliged daily to deliver his master a certain fixed number of pearls; so that when they have got the requisite number of oysters in their bag, they begin to open them, and deliver the pearls to the officer, till they have made up the number due to their master; and if the pearl be but formed, it is sufficient, without any regard to its being small or faulty. The remainder, however large or beautiful, are the negro's own property, nor has the master the least claim to them, the slaves being allowed to sell them to whom they please, though the master generally purchases them at a very small price.

These negroes cannot every day make up their number, as in many of the oysters the pearl is not at all, or but imperfectly formed, or the oyster is dead, whereby the pearl is so damaged as to be of no value; and as no allowance is made for such pearls, they must make up their numbers with others.

Besides the toil of this fishery, from the oysters strongly adhering to the rocks, they are also in no small danger from some kinds of fish, which either seize the negroes, or by striking on them, crush them by their weight against the bottom. Every negroe to defend himself against these animals, carries with him a sharp knife, with which if the fish offers to assault him, he endeavours to strike it in a part where it has no power to hurt him; on which the fish immediately flies. The officer keeps a watchful eye on these voracious creatures, and on discovering them, shake the ropes fastened to the negroes bodies, that they may be upon
themselves

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their guard; many, on the divers being in danger, have thrown themselves into the water, with the like weapon, and hasten down to their defence: but too often all their dexterity and precaution is not sufficient to protect the diver from being devoured by these fish, or losing one of his legs or arms by their bite. Several schemes have been practised to prevent such melancholy accidents; but they have hitherto proved very ineffectual.

The pearls of these fisheries are generally of a good water, and some very remarkable both in their shape and size; but there is a difference in their water and colour; some being highly valuable, and others as remarkably defective. Some of these pearls, though indeed but few, are sent to Europe, the greatest part being carried to Lima: where the demand for them is very great, being not only universally worn there by all persons of rank, but also sent from thence into the inland parts of Peru.

Mother of PEARL, the shell, not of the pearl-oyster, but of another sea fish of the oyster kind. This shell on the inside is extremely smooth, and of the whiteness and water of pearl itself; and it has the same lustre on the outside, after the first laminæ or scales have been cleared off with aqua fortis, and the lapidaries mill. Mother of pearl is used in inlaid-works, and in several toys, as snuff-boxes, &c.

PEARL, in heraldry, in blazoning with precious stones, is the same with argent or white.

PEAT, a kind of turf used for fuel in several countries.

PEBBLES, *Calculi*, small stones, composed of a crystalline matter debased by earths, and hence subject to veins, clouds, and other variegations.

PECCANT, in medicine, a term used for those humours of the body which offend either by their quantity or quality.

PECK, a measure of capacity, four of which make a bushel.

PECTORAL, an epithet for medicines good for disorders of the breast and lungs. The ordinary intention of these medicines is either to attenuate or thicken the humours of these parts, and to render them fit to be expectorated or spit out.

PECTORALIS, in anatomy, a pair of muscles which possesses almost the whole breast, and serves to move the arm forwards. Naturalists observe a singular mark of providence, in the size and strength of the pectoral muscle in differ-

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ent animals. It is by the action of this muscle, that the flying of birds is chiefly performed; and therefore much larger and stronger in birds, than in any animals not made for flight.

PECULIAR, in the canon law, signifies a particular parish or church that has jurisdiction within itself for granting probates of wills, and administration, exempt from the ordinary or bishop's courts. The king's chapel is a royal peculiar, exempt from all spiritual jurisdiction, and reserved to the visitations and immediate government of the king himself. There is likewise the archbishop's peculiar; for it is an ancient privilege of the see of Canterbury, that wherever any manors or advowsons belong to it, they forthwith become exempt from the ordinary, and are reputed peculiars: there are fifty-seven such peculiars in the see of Canterbury. Besides these, there are some peculiars belonging to deans, chapters, and prebendaries, which are only exempted from the jurisdiction of the archdeacon; these are derived from the bishop, who may visit them, and to whom there lies an appeal.

Court of PECULIARS, a court in which the affairs belonging to peculiars are transacted.

PEDAGOGUE, or *PÆDAGOGUE*, *παιδαγωγός*, a tutor or master, to whom is committed the discipline and direction of a scholar, to be instructed in grammar and other arts.

PEDANT, a rough unpolished man of letters, who makes an impertinent use of the sciences, and abounds in unseasonable criticisms and observations. Dacier defines a pedant, a person who has more reading than good sense; and Malebranche describes him, as a man full of false erudition, who makes a parade of his knowledge, and is ever quoting some Greek or Latin author, or hunting back to a remote etymology.

PEDANTRY, the quality or manner of a pedant.

PEDESTAL, in architecture, the lowest part of an order of columns, being that which sustains the column, and serves it as a foot or stand. The pedestal consists of three principal parts, viz. a square, trunk, or dye, which makes the body; a cornice, the head; and a base, the foot of the pedestal. The pedestal is properly an appendage to a column, not an essential part of it; though M. Le Clerc thinks it essential to a complete order. There are as many kinds of pedestals as there

are of orders of columns, viz. the Tuscan, Doric, Ionic, Corinthian, and Composite.

PEDESTALS of Statues, such as serve to support statues of figures. Vignola observes, that there is no part of architecture more arbitrary, and in which more liberty may be taken, than in the pedestals of statues; there being no rules or laws prescribed by antiquity, nor any settled even by the moderns.

PEDICLE, among botanists, that part of a stalk which immediately sustains the leaf of a flower or a fruit, and is commonly called a foot-stalk.

PEDICULUS, *Louse*, in zoology, a genus of insects. Most animals are infested with lice, or insects which feed upon them: thus sheep have one species, oxen another, &c. and mankind are not free from them; for besides the common kind, whose natural habitation is in the heads of children, there is another kind called the crab-louse, whose natural residence is about the pubes. Authors also reckon the death-watch among the number of lice.

PEDILUVIUM, a bathing of the feet.

This bath may be prepared of the same ingredients with other baths. It may either consist of light, pure water alone; or, to correct the qualities of heavy and hard water, a lixivium of bran of wheat or chamomile-flowers may be added. Pediluvium is highly expedient for the purposes of derivation in those diseases which arise from congestions of the humours to the head and breast, produced by spasms of the inferior parts, and especially of the hypochondria. Among this kind, besides lethargic diseases, we may reckon almost all disorders of the head, such as madness, melancholy, cephalæas, hemicranias, the clonus hystericus, vertigo's, tooth-achs, pains of the ears, a gutta rosacea; inflammations and defluxion of saline humours on the eyes, immoderate hæmorrhages from the nose, and long watchings. Of this kind are also some disorders which affect the breast, such as convulsive asthma's, dyspnoeas arising from a plethora, palpitations of the heart, dry coughs, and spittings of blood. Besides, baths for the feet in consequence of their singular efficacy in relaxing spasms, are highly beneficial in spasmodic and convulsive disorders, in pains, cardialgias, colics, especially of the hæmorrhoidal kind, gripes produced by the stone, and infusions of the stomach.

It is to be observed, that pediluvium

produces more happy effects, if before it is used the quantity of blood is lessened by venesection in the feet: it should be used about bed-time; and the feet kept warm till the patient goes to bed, by which means perspiration all over the body is increased.

PEDIGREE. See *Descent*.

PEDIMENT, in architecture, a kind of low pinnacle, serving to crown an ordinance, or finish a frontispiece, and is placed as an ornament over gates, doors, windows, niches, altars, &c. being ordinarily of a triangular form, but sometimes forming an arch of a circle. The parts of a pediment are the tympanum and the cornice, which crowns it, and the entablature, which serves it as a base, or scale. Architects have taken a great deal of liberty in the form of this member; nor do they vary less as to the proportion of the pediment. The most beautiful, according to Daviler, is that where its height is about one fifth of the length of its base.

The pediment is usually triangular, and sometimes an equilateral triangle, called also a pointed pediment; it is sometimes circular, though M. Felibien observes, that we have no instance of round pediments in the antique, besides those in the chapels of the rotundo. Sometimes its upper cornice is divided into three or four sides, or right lines: sometimes the cornice is cut or open a-top, which is an abuse introduced by the moderns, particularly Michael Angelo; for the design of this part over doors, windows, &c. being chiefly to shelter those underneath from the rain, to leave it open in the middle is to frustrate its end. Sometimes the pediment is formed of a couple of scrolls or wreaths like two consoles joined together; sometimes again it is without a base or its lower cornice is cut out, all but what is bestowed on two columns or pilasters, and on these is raised an arch or sweep, instead of an entablature, of which Serlio gives an instance in the antique in a Corinthian gate at Foligny, in Umbria; and Daviler a modern one in the church of St. Peter at Rome.

Under this kind of pediments come those little arched corniches, which form pediments over doors and windows, supported by two consoles, instead either of entablature or columns.

Sometimes the pediment is made double, i. e. a less pediment is made in the tympanum of a larger, on account of some

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some projecture in the middle, as the frontispiece of the church of the Great Jesus at Rome; but this is accounted an abuse in architecture, though authorised by very good buildings, as the large pavilion of the Louvre, where the Caryatides support three pediments, one in another: sometimes the tympanum of the pediment is cut out, or left open to let in light, as is seen under the portico of the capitol at Rome; lastly, this open pediment is sometimes triangular, and enriched with sculpture, as roses, leaves, &c. as is found in most of the Gothic churches.

M. Le Clerc observes, that the modillions in the cornice of the pediment should always answer exactly over those of the entablature. Indeed Vitruvius says, that the ancients did not allow of any modillions at all in pediments. M. Le Clerc also observes, that the cornice which serves the pediment as a base, should have no cymatium, by reason the cymatium of the rest of the entablature, when it meets the pediment, passes over it. This change of determination occasions a considerable difficulty; the cymatium in this case appearing too broad in the turn of the angle, to remedy which architects have recourse to several expedients.

A pointed pediment may crown three arches, but a circular pediment can only crown agreeably. There should never be used more than two tympana over each other in the same frontispiece, and even where there are two, it would be proper to have the lower circular, and the upper pointed.

PEDRERO, PETERERO, or PATERERO, a small piece of ordnance, used on board ships, for the discharging of nails, broken iron, or partridge shot, on an enemy attempting to board. They are generally open at the breach, and their chamber made to take out, to be loaded that way, instead of at the muzzle.

PEDUNCULI CEREBELLI, in anatomy, three medullary processes of the cerebellum, whereby that part is joined to the medulla oblongata.

PEER, in general, signifies an equal, or one of the same rank and station. The term peers is now applied to those who are impannelled in an inquest upon a person for convicting or acquitting him of any offence laid to his charge; and the reason why the jury is so called, is because by the common law, and the cus-

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tom of this kingdom, every person is to be tried by his peers or equals, a lord by the lords, and a commoner by commoners.

PEER of the Realm, a noble lord who has a seat and vote in the house of lords. These lords are called peers, because, though there is a distinction of degrees in our nobility, yet in public actions they are equal, as in their votes in parliament, and in trying any nobleman or other person impeached by the commons, &c.

PEERESS, a woman who is noble by descent, creation, or marriage.

PEGASUS, among the poets, a horse imagined to have wings, being that whereon Bellerophon was fabled to be mounted, when he engaged the Chimæra.

The opening of the fountain Hippocrene, on mount Helicon, is ascribed to a blow of Pegasus's hoof. Pegasus was feigned to have flown away to heaven, where it became a constellation.

PEGASUS, in astronomy, a constellation of the northern hemisphere, in form of a flying horse, said by different authors to contain nineteen, twenty, and ninety-three stars.

* **PEGASUS**, in fabulous history, a winged horse, produced as some say, by Neptune, and others, that he sprang from the blood of Medusa, when Perseus cut off her head. With a stroke of his hoof, he caused the fountain Hippocrene to spring out of the earth. Bellerophon mounted him in order to attack Chimæra, after which Pegasus is said to have been placed among the stars. Mythologists give different interpretations of this fable. Some imagine that he was a very swift running horse, and others that he was a ship belonging to Bellerophon.

* **PEGU**, a kingdom of the East Indies, on the S. E. side of the bay of Bengal in Asia. It is bounded on the N. by the kingdom of Ava, on the W. and S. by the ocean, and on the E. by the kingdoms of Laos and Siam. It has a town of the same name, 70 miles within land, and was a strong place, above 20 miles in circumference; but is at present very thinly inhabited. The product of this country is timber for building, elephants-teeth, bees-wax, sticklac, iron, tin, pertolzum, very fine rubies, and small diamonds. They have also saltpetre, and plenty of lead, of which they make their money. It is very fruitful in corn, roots, pulse, and fruits, and wild game is very common. They have also good

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good fish, pork, and poultry. The government is arbitrary, the king's will being a law; and yet he does not often abuse his power. He has a large handsome stone palace at Ava. The inhabitants are but thinly clad, and the best among them wear neither shoes nor stockings. The Barmaes go almost naked, and make figures on their skins like the ancient Picts, by pricking them in with a bodkin, and rubbing them over with charcoal. The women are much whiter than the men, and are small, but well proportioned. They wear petticoats, which are open before: the women are very fond of strangers; and any man may have a wife for the time he stays there. The wife goes to market, dresses the victuals, takes care of her husband's cloaths, and sells his goods by retail. If she proves false, the husband may sell her for a slave, and if he goes astray, she will give him a dose of poison. There are a vast number of temples in this country, but most of wood, which are varnished and gilded. The priests have ground allowed them, which they cultivate for their subsistence; and they are said to be strict observers of morality. They are called Talapoins, and inculcate charity as the highest virtue, affirming that religion to be the best which teaches men to do most good. They have idols in their temples in a sitting posture, like taylor's, and they have all very large ears. When any persons happen to be shipwrecked on the coast, if they repair to the temples, they will be taken care of, and supplied with what they want. In the low flat part of the country, liable to be overflowed, they build their houses upon stakes; and then in times of inundations, they communicate with each other by boats. The king of Ava, who resides at the palace abovementioned, is now master of Pegu, Long. 97. 8. E. Lat. 17. 26. N.

* PEKIN, or PEKING, a city, and the metropolis of the whole empire of China, where the emperor generally keeps his court, is seated in a very fruitful plain, 60 miles S. of the great wall, and is of an exact square. It is divided into two parts; the New or Tartars city; and the Old or Chinese city. The circumference of the walls, exclusive of the suburbs, is about 52 Chinese lys, which contain 240 geometrical paces each. The walls are high and broad, and a horse may ascend to the top of those of the new city by a slope of a great length.

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They have towers within a bow-shot of each other, and the gates, which are high with strong arches, support pavilions 9 stories high. Each story has windows or port-holes, and in the lowest there is a large hall for the officers and soldiers, when they come off the guard. Before each gate there is a parade, surrounded by a semi-circular wall. All the gates of the city, which are 9 in number, are built alike, and are well furnished with artillery. The chief streets are as strait as a line, 3 miles in length, and 120 feet wide, with shops on each side of the way. The houses are wretchedly built, and low, being chiefly of one story, which makes it surprising that there are such vast crowds of men in the streets; for there is not a woman to be seen among them. There is also a prodigious number of horses, mules, asses, camels, carts, waggons, and chairs; not to mention the people that gather round fortune-tellers, jugglers, ballad-singers, quack-doctors, and the like. For this reason persons of distinction have always horsemen going before them to clear the way; on which account, those that can afford it, pass through the streets in chairs, or on horses, which stand to be hired at an easy rate, and the owners lead them along to make way. These are the more convenient, because they know the place where every considerable person lives. Every thing is so well managed here, that there is seldom any disturbance, and a robbery, or burglary, does not happen in many years; and when they do, the criminals never escape being taken. Every great street has night and day a guard of soldiers, with swords by their sides, and whips in their hands, wherewith they are ready to chastise offenders; they have likewise a power to take into custody those who resist, or begin a quarrel. The ends of the little streets where they come into the greater, have lattice gates. These gates are shut at night, and are seldom opened unless to persons well known, who carry a lantern in their hand, and give a reason for their being out at that time of night. The southern gate of this city is likewise the gate of the emperor's palace, which is a prodigious heap of great buildings, with large courts and gardens. This has battlements along the curtain, and is adorned with little pavilions at the angles. The architecture of the imperial palace is entirely different from that of Europe, and yet it strikes the eye by its grandeur.

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grandeur. The roofs which join to the walls are supported by a forest of beams, joists, and spars, all japanned with gold flowers on a green ground. The terraces upon which the apartments are built, are about 15 feet high, and cased with white marble, and are adorned with a balustrade of tolerable workmanship. Long. 116. 41. E. Lat. 39. 54. N.

PELECOIDES, in geometry, a figure in form of an hatchet; such is the figure B C D A, plate XLI. *fig.* 5. contained under the two inverted quadrantal arcs A B and A D, and the semi-circle B C D. The area of the pelecoïdes is demonstrated to be equal to the square A C, and that again to the parallelogram E B. It is equal to the square A C, because it wants of the square on the left hand the two segments A B and A C, which are equal to the two segments B C and C D, by which it exceeds on the right hand.

* **PELIAS**, in fabulous history, the son of Neptune by Tiro, and the brother of Æson, king of Thessaly, usurped the kingdom to the prejudice of Jason, his nephew, who was concealed from his fury. Jason, having attained the age of 20 years, made himself known to his parents, and demanded the possession of his dominions. This Pelias could not refuse, he however prevailed on him to undertake the conquest of the Golden Fleece, hoping that he would perish in that expedition. Pelias became at length more haughty and cruel, and was murdered by his own daughters, in attempting, by Medea's advice, to restore him to youth.

PELICAN, *Pelicanus*, in ornithology, a genus of birds, of the order of the anseres, the beak of which is very long, crooked, and unguiculated at the extremity: its sides are not denticulated, and the anterior part towards the head is naked.

PELICAN, in chemistry, a kind of double vessel, generally made of glass, and used in extracting tinctures by circulation.

PELLUCID, the same with diaphanous or transparent, and stands opposed to opaque. See *Transparent*.

PELVIS, the inferior part of the cavity of the abdomen, so called from its resembling a basin or ewer, in Latin called pelvis. See *Abdomen*.

PELVIS of the Kidneys, a membranaceous cavity in the kidneys, which receives the urine, and conveys it to the ureters.

PEN

* **PEMBROKE**, the county town of Pembrokeshire, in S. Wales. It has a market on Saturdays, and 4 fairs, May 14, Trinity-Monday, July 10, and September 25, for cattle, horses, sheep, and cloth. It is seated on the eastern or innermost creek of Milford-haven; over which it has two handsome bridges. It is well inhabited by gentlemen and tradesmen. As this town is frequented by ships, it has a custom-house, and is fortified with a wall, which has several towers, and 3 gates. It has 3 parish churches, and its houses are well built. It is governed by a mayor, 2 bailiffs, and sub-officers, and sends one member to parliament. It gives title of Earl to a branch of the Herbert family. It is 236 miles W. by S. from London.

* **PEMBROKESHIRE**, a county of South Wales, bounded on the E. by the counties of Cardigan and Camarthen, and on the N. W. and S. by the Irish sea. It is one of the best of the Welch counties, having plenty of pasture land, and cattle. It has also a great many rivers, and plenty of good fish, as well from thence as out of the sea; as also water-fowls in large quantities. It is likewise noted for its pit-coal. Its extent from E. to W. is about 20 miles, and from N. to S. about 26. It is in the diocese of St. David's, and contains 45 parishes, and 9 towns. Pembroke is the shire town, and St. David's is a bishop's see.

PENANCE, a punishment either voluntary, or imposed by authority for the crimes a person has committed.

PENATES, in Roman antiquity, were a kind of tutelar deities, either of countries or particular houses; in the latter sense they were the same with the lares.

PENCIL, an instrument used by painters for laying on colours. Pencils are of various kinds, and made of various materials.

PENCIL, an instrument used in drawing, &c. made of long pieces of black-lead, or red-chalk, placed in a groove cut in a slip of cedar, on which other pieces of cedar being glued, the whole is planed round, and one of the ends being cut to a point, it is fit for use.

PENDANT, an ornament suspended to the ear, frequently consisting of diamonds, pearls, and other precious stones.

PENDULOUS, applied to any thing that bends or hangs downwards: thus, the

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the flowers, whose slender stalks are not able to sustain their heads upright, are called pendulous flowers.

PENDULUM, in mechanics, any heavy body so suspended, as that it may vibrate backwards and forwards, about some fixed point, by the force of gravity. The word is derived from the Latin *pendo*, to hang, or be suspended. A pendulum is any body, as B (plate XLI. fig. 6.) suspended upon, and moving about a point A as a center. The nature of a pendulum consists in the following particulars: 1. The times of the vibrations of a pendulum, in very small arches are all equal. 2. The velocity of the bob, in the lowest point, will be nearly as the length of the chord of the arch which it describes in the descent. 3. The times of vibration in different pendulums, A B, A C, are directly as the square roots of their lengths. 4. The time of one vibration is to the time of the descent, through half the length of the pendulum, as the circumference of a circle to its diameter. 5. The quantity of matter in the pendulous body is as the weight and the square of the time directly, and the length of the pendulum inversely. 6. Whence the length of a pendulum, vibrating seconds, will be found 39 inches nearly; and of one half-second pendulum 9,8 inches.

From these properties of the pendulum we may discern its use as an universal chronometer, or regulator of time, as it is used in clocks, and such-like machines. By this instrument also we can measure the distance of a ship, by measuring the interval of time between the fire and the sound of the gun; also the distance of a cloud, by numbering the seconds, or half seconds, between the lightning and thunder. Thus, suppose between the lightning and thunder, we number 10 seconds; then, because sound passes through 1142 feet in one second, we have the distance of the cloud equal to 11420 feet. Again, the height of any room, or other object, may be measured by a pendulum vibrating from the top thereof. Thus, suppose a pendulum from the height of a room vibrates once in three seconds; then say, as 1 is to the square of 3, viz. 9, so is 39,2 to 352,8 feet, the height required. Lastly, by the pendulum we discover the different force of gravity on diverse parts of the earth's surface, and thence the true figure of the earth. See the article *Earth*.

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The greatest inconvenience attending this most useful instrument is, that it is constantly liable to an alteration of its length, from the effects of heat and cold, which very sensibly expand and contract all metalline bodies, as is evident from the pyrometer. See *Pyrometer*.

When pendulums were first applied to clocks, they were made very short; and the arches of the circle being large, the time of vibration, through different arches, could not in that case be equal; to effect which, the pendulum was contrived to vibrate in the arch of a cycloid.

In all that has been hitherto said, the power of gravity has been supposed constantly the same. But, if the said power varies, the lengths of pendulums must vary in the same proportion, in order that they may vibrate in equal times. See *Vibration*.

* **PENELOPE**, in fabulous history, the daughter of Icarus, married Ulysses, by whom she had Telemachus. During the absence of Ulysses, when he was at the siege of Troy, and who was 20 years from his dominions, several princes, charmed with Penelope's beauty, assuring her that Ulysses was dead, offered to marry her, and pressed her to declare in their favour. She promised them, if they would give her time to finish a piece of tapestry she was weaving, but at the same time undid in the night what she had done in the day, and by this ingenious artifice, eluded the importunity of those who sought her in-marriage till Ulysses's return.

PENETRATION, the art whereby one thing takes the place of another, or has its extension in the same part of space before possessed by the other.

PENGUIN, in ornithology, the name of a sea-bird common on the coasts of America, especially about the banks of Newfoundland, and the islands about the Straights of Magellan. It has eight furrows on the beak, and white spots before the eye; it is a very singular bird, and about the size of a goose.

PENIS, the **YARD**, in anatomy, the primary organ of generation in man; being called also mentula, virga, priapus, and by a multitude of other names.

Anatomists divide the penis into three parts, the body, the glans, and the urethra. In the body of the penis, are observable the cuticle and cutis, as the common integuments; the prepuce, being a reduplication of the cutis covering the glans; and

and in the lower of this is fixed the frænulum, all which are described under their several heads.

After there is observable the proper teguments or coats of the penis. This is a robust coat, of a membranous nature, surrounding every part of the penis. It is sometimes double, and has in the interstitial space a cellulose coat, which is discoverable by inflation and drying in that state. Under this are the two bodies which constitute the penis; these, being called the corpora cavernosa, or spongiosa, are described under the article *Cavernose*.

PENITENCE, the same with repentance; but is also used for the discipline or punishment, usually called penance.

PENITENTS, an appellation given to certain fraternities of penitents distinguished by the different shape and colour of their habits.

* **PENN**, William, an eminent writer among the Quakers, and the planter and legislator of Pennsylvania, was born at London, the 14th of October, 1644. In 1660, he was entered a gentleman commoner of Christ-church, in Oxford, where having before received an impression from the preaching of one Thomas Loe, a quaker, withdrew, with some other students, from the national worship, and held private meetings, for prayer and preaching. This gave great offence to the heads of the colleges, and Mr. Penn, though but 16 years of age, was fined for nonconformity, and, still continuing his religious exercises, was at length expelled his college. Upon his return home, he was, for the same reason, treated with great severity by his father, who at last turned him out of doors; but his resentment abating, he sent him to France with some persons of quality, where he continued a considerable time, and returned not only well skilled in the French language, but a polite and accomplished gentleman. About the year 1666, his father committed to his care a considerable estate in Ireland; but being found in one of the quakers meetings in Cork, he, with many others, was thrown into prison, but, on his writing to the earl of Orrery, was soon discharged. However, his father being informed of this, sent for him to England, and finding him inflexible to all his arguments, turned him out of doors a second time. About 1688, he became a public preacher among the quakers, and that year was

committed close prisoner to the Tower, where he wrote several treatises, and being discharged after seven months imprisonment, went to Ireland, where he also preached amongst the quakers. Returning to England, he was, in 1670, committed to Newgate for preaching in Gracechurch-street meeting-house, London, but being tried at the sessions-house in the Old Bailey, he was acquitted. On the 16th of September, the same year, his father, who was then perfectly reconciled to him, died, and left him a plentiful fortune; but his persecutions were not yet at an end; for, the 5th of February, 1671, he was committed to Newgate, for preaching at a meeting in Wheeler-street, London, and during his imprisonment, which lasted six months, he wrote several treatises. After his discharge, he went into Holland and Germany; and in 1672, married and settled with his family, at Rickmansworth, in Hertfordshire. The same year he published several pieces, and particularly one against Reeve and Muggleton. In 1677, he again travelled into Holland and Germany, to propagate his opinions. In 1681, Charles II. in consideration of the several debts due from the crown to Mr. Penn's family; granted him and his heirs the province lying on the west side of the river Delaware, in North America, which from thence obtained the name of Pennsylvania, upon which Mr. Penn published a brief account of that province, with the king's patent, and proposing an easy purchase of lands, and good terms of settlement for such as were inclined to remove thither; many went over, when he appointed commissioners to purchase the land he had received from the King of the native Indians, and concluded a peace with them. The city of Philadelphia was planned and built; and he himself drew up the fundamental constitutions of Pennsylvania in 24 articles. In 1681, he was elected a member of the Royal Society; and the next year, embarked for Pennsylvania, where he continued about two years, and then returned to England. Upon the accession of king James to the throne, he was taken into great favour with his majesty, which exposed him to the imputation of being a papist; and Dr. Tillotson among others, having entertained a suspicion of him, Mr. Penn fully vindicated himself; however, upon the revolution, he was examined before the council, in December 1688, and obliged to give secu-

rity on the first day of term, which was afterwards continued. He was several times discharged and examined; and at length warrants being issued out against him, he was obliged to conceal himself for two or three years; however, being at last permitted to appear before the king and council, he represented his innocence so effectually that he was acquitted. In 1699, he, with his wife and family, embarked for Pennsylvania, whence he returned in 1701, in order to vindicate his proprietary right, which was attacked during his absence. Upon queen Anne's accession to the crown, he was in great favour with her; but, in 1707, he was involved in a law-suit with the executors of a person who had been formerly his steward; but though he was generally thought to be aggrieved, the court of Chancery did not think proper to relieve him, in consequence of which, he was obliged to live within the rules of the Fleet for several months, till the matter in dispute was accommodated. He died, at his seat, at Twyford, in Buckinghamshire, the 30th of July, 1718, in the 74th year of his age. Mr. Penn's generous and pacific spirit, joined to his great abilities, deservedly procured him respect from the most distinguished persons, and made him universally beloved.

PENNY, in commerce, an ancient English coin, which is now generally a money of account.

It was equal in weight to our three-pence; five of which made a Saxon scilling, and thirty a mark, or mancuse, equal to our seven shillings and sixpence.

Till the time of Edward I. the penny was struck with a cross, so deeply indented, that it might be easily broke into two, thence called half pennies, or into four, called four things, or farthings: but that prince coined it without indenture, and struck round the halfpence and farthings. He also ordered that the penny should weigh thirty-two grains of wheat, and called it the penny sterling, twenty of which were to weigh an ounce.

At present a penny, bating a few silver pence current among us, is only a money of account, containing the twelfth part of our shilling, or the two hundred and fortieth part of a pound.

PENNY-WEIGHT, a Troy weight, containing twenty-four grains, each equal in weight to a grain of wheat, gathered out of the middle of the ear, and well dried.

* **PENNSYLVANIA**, one of the English plantations in North America, between thirty-nine and forty-two degrees of north latitude, and is bounded by the five nations of Iroquois on the north, by New Jersey and New York on the east, and by Maryland on the south and west, being two hundred miles in length, and almost as much in breadth. It is well watered by the river Delawar and other navigable rivers, which bring large ships up into the heart of the province. The produce of this country is corn, cattle, timber, pot-ashes, wax, skins, and furs; and they carry to the Caribbee islands salted beef, pork, horses, pipe-staves, and fish, taking in return, sugar, rum, and molasses. From England they have cloathing, furniture, hard-ware, and all sorts of tools. The principal inhabitants are quakers.

PENSION, a sum of money paid annually for services, or considerations already past.

PENSIONARY, or **PENSIONER**, one who has an appointment, or yearly sum, payable during life, by way of acknowledgment, charged on the estate of a prince, company, or particular person.

Grand **PENSIONARY**, an appellation given to the first minister of the states of Holland.

PENSIONARY, the first minister of the regency of each city in Holland.

PENSIONER, a person who receives a pension, yearly salary, or allowance.

PENTAGON, in geometry, a figure of five sides and five angles.

If the five sides be equal, and also the angles, the figure is called a regular pentagon, as plate xli. fig. 7.

The most considerable property of a regular pentagon is, that one of its sides DE is equal in power to the sides of a hexagon, and a decagon, inscribed in the same circle ABCDE; that is, the square of the side DE, is equal to the sum of the squares of the sides Da and Db.

Pappus has also demonstrated, that twelve regular pentagons contained more than twenty equilateral triangles inscribed in the same circle, *lib. 5. probl. 45.*

The dodecahedron, which is the fourth regular solid, consists of twelve pentagons.

PENTAGRAPH, or **PARALLELOGRAM**, an instrument whereby designs of any kind may be copied in what proportion you please, without being skilled in drawing.

PENTAMETER, in ancient poetry, a kind of verse consisting of five feet, or metres; whence the name. The two first feet may be either dactyls or spondees, at pleasure; the third is always a spondee, and the two last anapeests.

PENTANDRIA, in botany, one of Linnæus's classes of plants, the fifth in order; the characters of which are, that all the plants comprehended in it have hermaphrodite flowers, with five stamina or male parts in each: they are subdivided into orders, which are denominated *monogynia*, *digynia*, *trigynia*, &c. according as there are one, two, three, &c. pistils, or female parts, in each flower. See *Stamina*.

To this genus belongs the vine, of the order of the *monogynia*; the elm, of the *digynia*; sumach, of the *trigynia*, &c.

PENTAPETALOUS, an appellation given to flowers that consist of five perals of leaves.

PENTATEUCH, *πεντάτευχος*, an appellation given to the first five books of the Old Testament, viz. Genesis, Exodus, Leviticus, Numbers, and Deuteronomy.

The Samaritans acknowledge no other criptures besides the Pentateuch, which they still preserve in the old Hebrew or Phœnician character, as also in the vulgar Samaritan.

PENTECOST, a solemn festival of the Jews, so called because it was celebrated on the fiftieth day after the sixteenth of the month Nisan, which was the second day of the passover.

The feast of Pentecost was instituted in memory of the law's being given on the fiftieth day after the Israelites came out of Egypt.

It was on the feast of Pentecost that the Holy Ghost miraculously descended on the apostles.

PENUMBRA, in astronomy, a partial shade observed between the perfect shadow and the full light in an eclipse. It arises from the magnitude of the sun's body; for were he only a luminous point, the shadow would be all perfect; but by reason of the diameter of the sun, it happens that a place which is not illuminated by the whole body of the sun, does yet receive rays from a part thereof.

PEPPER, *Piper* in natural history, an aromatic fruit or berry, of a hot dry quality, growing in Sumatra, Java, and Malabar. The pepper-corns adhere in clusters to the stalks, with pedicles: when ripe, they are firm, not juicy, of

a red colour, which changes in drying to a black.

We have three kinds of pepper at this time in use in the shops; namely, the black, the white, and the long pepper.

Common or Black PEPPER, the fruit gathered, probably, before perfect maturity, and dried in the sun.

White PEPPER, the ripe fruit decorated by maceration in water. Some of the grains, as brought to us, have pieces of a dark coloured skin still upon them.

Of these pungent hot spices, the black sort is the hottest and strongest, and most commonly made use of for medicinal as well as culinary purposes. They both seem to heat the constitution more than some other spices that are of equal pungency upon the palate; and from those spices they differ in this, that their pungency does not reside in the volatile parts or essential oil, but in a substance of a more fixed kind, which does not rise in the heat of boiling water. Pepper, infused in water, impregnates the menstruum pretty strongly with its flavour, but weakly with its taste; by boiling for some time, a little more of its pungent matter is extracted, and its flavour dissipated.

Long PEPPER, the fruit of an East Indian plant of the same genus with that which produces the black pepper; of a cylindrical figure, about an inch and a half in length, having numerous minute grains disposed round it in a kind of spiral direction. This spice is hotter and more pungent than either of the preceding kinds, and its spirituous extract is proportionably more fiery.

Jamaica PEPPER, See *Pimento*.

PERAMBULATION, in law, the walking about a forest, parish, or the like, by justices, or others, in order to mark down and preserve the limits and bounds thereof.

PERAMBULATIONE FACIENDA, a writ commanding the sheriff to make perambulation, in order to settle the bounds of two adjoining manors.

PERAMBULATOR, in surveying, an instrument for measuring distances, called also pedometer, way-wiser, and surveying wheel.

Its proper office is in the surveying of roads and large distances, where a great deal of expedition, and not much accuracy, is required.

Its advantages are its handiness and expedition;

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pedition; its contrivance is such, that it may be fitted to the wheel of a coach, in which state it performs its office, and measures the road without any trouble at all.

PER ARSIN ET THESIN, in music. Per arsin, in a song, counterpoint, fugue, &c. is when the notes ascend from grave to acute; and per thesin, when they descend from acute to grave.

PERCEPTION, in logic, the first and most simple act of the mind, whereby it perceives or is conscious of its ideas. See *Idea*.

In bare perception, the mind is in general only passive; yet impressions made on the senses cause no perception, unless they are taken notice of by the mind, as we see in those who are intently busied in the contemplation of certain objects. It ought also to be observed, that the ideas we receive by perception are often altered by the judgment, without our taking notice of it: so that we take that for the perception of our senses, which is but an idea formed by the judgment: thus, a man who reads, or hears, without attention, takes little notice of the characters or sounds, but of the ideas excited in him by them. See *Judgment*.

The faculty of perception seems to be that which constitutes the distinction between the animal kingdom and the inferior parts of nature. Perception is also the first step towards knowledge, and the inlet of all the materials of it; so that the fewer senses a man has, and the duller the impressions that are made by them are, the more remote he is from that knowledge which is to be found in other men.

PERCH, or **PEARCH**, *Pica*, the name of a fish distinguished by several transverse streaks, and by having the belly-fins red: it grows in some places to a foot and an half in length, and is considerably thick in proportion; but its more usual size is eight or nine inches in length: its nostrils are large and patulous, and nearer the eyes than the extremity of the snout.

PERCH, a measure of length. See *Measure*.

PERCUSSION, the act of striking. See *Motion*.

Center of PERCUSSION of a Body or Figure in Motion, is that point in which all the forces of the same are considered as united together in one; so that if the said figure meets any obstacle contrary to the motion thereof, it strikes the obstacle

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with a greater force than any other point of the figure; and consequently, if the percutient body revolves round a fixed point, and in its motion strikes any obstacle with its center of percussion, it will, during a small particle of time, preserve an equilibrium about that point.

PERENNIAL, in botany, is applied to those plants whose roots will abide many years, whether they retain their leaves in winter or not; those which retain their leaves are called ever-greens; but such as cast their leaves are called deciduous, or pedifols. Some of these have annual stalks, which die to the root every autumn, and shoot up again in the spring; to which Jungius gives the title of *radix restibilis*.

PERFECT, something to which nothing is wanting; or that has all the requisites of its nature and kind.

PERFECTION, the state or quality of a thing perfect.

PERFUME, *Suffragium*, an agreeable artificial odour, affecting the organ of smelling. The generality of perfumes are made up of musk, ambergrise, civet, rose and cedar-woods, orange-flowers, jessmin, jonquils, tuberose, and other odoriferous flowers: those drugs commonly called aromatics, such as storax, frankincense, benzoin, cloves, mace, &c. enter the composition of a perfume: some are also composed of aromatic herbs or leaves, as lavender, marjoram, sage, thyme, hyssop, &c.

PERIANTHIUM, in botany, expresses that sort of cup of a flower which either consists of several leaves, or else of one leaf divided into several segments, and surrounds the lower part of the flower.

PERICARDIUM, in anatomy, a membranaceous bag, loosely including the heart, and situated in the middle and lower part of the thorax, between the two lobes of the lungs.

The uses of the pericardium are, 1. To support the heart in a pendulous state, especially when we lie down. 2. To defend the heart from the cold air taken in at the lungs. 3. To preserve it from being injured by water, by matter, or any other extraneous fluid in the cavity of the thorax; and, 4. To contain the liquor of the pericardium, as it is called, which serves to facilitate the motions of the heart.

* **PERICLYMINUS**, in fabulous history, the son of Neleus, and the brother of Nestor, was instructed by Neptune

ture to assume any form he pleased. But on his fighting with Hercules, he varied his shape in vain, and being conquered in the form of various beasts, assumed that of the eagle, and cuffing the hero's cheeks with his wings, and tearing his face with his beak, he then soared aloft, when Hercules bending his bow, shot him with an arrow, and killed him.

PERICARPIUM, among botanists, a covering or case for the seeds of plants. It is the germen of the pistil enlarged.

PERICRANIUM, in anatomy, a thick solid coat, or membrane, covering the outside of the cranium, or skull. Some call it by the name of periosteum, because of its adhering to the bone; others divide it into two membranes, the under one of which immediately invests the skull they call periosteum, and the upper pericranium. In effect, it is one double membrane, consisting, as most others do, of two coats. It is supposed to have its origin from the dura mater, which passing through the sutures of the skull, by means of several filaments, forms this thick membrane; at least it is found connected to the dura mater, by fibres transmitted from it to the membrane through the sutures. About the origin of the temporal muscles, the coats of the pericranium part; the outer passing over those muscles, and the inner still adhering close to the cranium. See *Periosteum*.

PERIGÆUM, *Perigee*, in astronomy, that point of the sun's or moon's orbit, wherein they are at their least distance from the earth; in which sense it stands opposed to apogee. See *Apogee*.

PERIHELIMUM, in astronomy, that point of a planet or comet's orbit wherein it is in its least distance from the sun; in which sense it stands in opposition to aphelium.

PERIMETER, in geometry, the bounds or limits of any figure or body.

The perimeter of surfaces or figures are lines, those of bodies are surfaces. In circular figures, instead of perimeter, we say circumference, or periphery.

PERINÆUM, or **PERINEUM**, in anatomy, the space between the anus and the parts of generation, divided into two equilateral divisions, by a very distinct line, which is longer in males than females. The perinæum is subject to laceration in a difficult birth. In this part an operation is performed, called a puncture of the perinæum, or perforation made into the urethra and bladder, to

discharge the urine when it is suppressed. See *Delivery*.

PERIOD, in astronomy, the time taken up by a star or planet in making a revolution round the sun; or the duration of its course till it returns to the same point of its orbit.

The periodical times of the planets round the sun are as follow:

The period of	days.	hours.	min.	seconds
Mercury - - -	87	23	15	53
Venus - - -	224	16	49	24
The earth - - -	365	6	9	14
Mars - - -	686	23	27	30
Jupiter - - -	4332	12	20	25
Saturn - - -	10759	6	36	26

See *Mercury, Venus, &c.*

There is a wonderful harmony between the distances of the planets from the sun, and their periods round him; the great law whereof is, that the squares of the periodical times of the primary planets are to each other as the cubes of their distances from the sun; and likewise, the squares of the periodical times of the secondaries of any planet, are to each other as their cubes of their distances from that primary. This harmony among the planets is one of the greatest confirmations of the Copernican hypothesis.

PERIOD, in chronology, a revolution of a certain number of years, or a series of years whereby time is measured: such are the following.

Calippic PERIOD, a system of seventy-six years.

The Calippic period comprehends 48 common years, and 28 intercalary ones, 940 lunations, and 22759 days. See the article *Cycle*.

Dionysian PERIOD, or **Victorian PERIOD**, a system of 532 lunæ solar and Julian years, which being elapsed, the characters of the moon fall again upon the same day and feria, and revolve in the same order, according to the opinion of the ancients.

This period is otherwise called the great paschal cycle, because the Christian church first used it, to find the true time of the pascha, or Easter. The sum of these years arise by multiplying together the cycles of the sun and moon.

Hipparchus's PERIOD, a system of 304 years, both lunar and solar, which being elapsed, Hipparchus thought that the reckoning by the lunar motion would coincide again with the solar measure. This

This period comprehends 3760 lunar months, or 111039 days; the sum of which arises from the multiplication of the Calippic period by 4, subtracting unity from the product.

Metonic PERIOD, that invented by Meton, being the same with the cycle of the moon.

PERIOD, in grammar, a small compass of discourse, containing a perfect sentence, and distinguished at the end by a point, or full stop, thus (.); and its members or divisions marked by commas, colons, &c.

PERIOD is also used for the character (.) wherewith the periods of a discourse are terminated, or expressed, being commonly called a full stop, or point. See *Punctuation*.

PERIOD, in numbers, a distinction made by a point, or comma, after every sixth place or figure; and is used in numeration for the reader distinguishing and naming the several figures or places.

PERIOD of a Disease, in medicine, the time between the access of one fit, or paroxysm, and that of the next, including the entire exacerbation, decline, and intermission, or remission.

PERIODIC, or *PERIODICAL*, something that terminates and comprehends a period; such as a periodic month, being the space of time wherein the moon dispatches her period.

PERIOECI, *περιοικοι*, in geography, such inhabitants of the earth as have the same latitudes, but opposite longitudes; or live under the same parallel, and the same meridian, but in different semicircles of that meridian, or in opposite points of the parallel. These have the same common seasons throughout the year, and the same phenomena of the heavenly bodies; but when it is noon-day with the one, it is midnight with the other, there being twelve hours between them in an east or west direction. These are found on the globe, by the hour index, or by turning the globe half round, that is 180 degrees either way.

PERIOSTEUM, or *PERIOSTIUM*, in anatomy, a nervous vascular membrane, endued with a very quick sense, immediately surrounding, in every part, both the internal and external surfaces of all the bones in the body, excepting only so much of the teeth as stand above the gums, and the peculiar places on the bones in which the muscles are inserted. It is hence divided into the external and internal periosteum, and where it exter-

nally surrounds the bones of the skull, it is generally called the pericranium.

This membrane serves to constitute the first rudiments of the bones in a fœtus in utero. It is the organ of secretion for the bony matter, as the membrana adiposa is for the fat; all the bones, during the time of their growth, receiving from it their matter of accretion, and afterwards their nutriment. The blood-vessels of the periosteum penetrate in innumerable places into the bones themselves, as is evidently seen in the fresh bones of children. The sensibility in the bones is wholly owing to this membrane; for when divested of this, they may be sawed, cut, or burnt without pain. It gives the determination and figure to bones, as is evident from this, that when it is wounded, exostoses, topi, and caries arise in the part. The periosteum is of different thickness in different parts, but in general the internal is vastly thinner than the external, and serves to nourish that part of the bones. It receives also nerves and blood-vessels from the outside, through certain canals in the substance of the bones, which it communicates to the marrow in such as have any. It is generally said to arise from the dura mater of the brain; but Heister thinks this opinion scarce right, as the periosteum is evidently formed at the same time with the dura mater in the fœtus.

PERIPATETIC PHILOSOPHY, that system taught and established by Aristotle, and maintained by his followers, the Peripatetics, called also Aristotelians.

Aristotle's philosophy preserved itself in *puris naturalibus*, a long time, none of his followers or commentators having dared to make any innovation therein, till the beginning of the thirteenth century, when it began to be new modelled. A reformed system of Peripateticism was first introduced into the schools in the university of Paris, from whence it soon spread throughout Europe, and has subsisted in the universities to this day, under the name of school philosophy; the foundation whereof is Aristotle's doctrine frequently misunderstood, and oftener misapplied: but of these, at different times, have sprung several branches, as the Thomists, Scotists, Nominalists, &c.

PERIPHERY, in geometry, the circumference of a circle, ellipsis, or any other regular curvilinear figure.

PERIPHRAISIS, in rhetoric, the same with circumlocution.

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PERIPNEUMONY, in medicine, an inflammation of the lungs, attended with a weight on the lungs, a difficulty of breathing, and an oppression of the breast, with a purulent spitting, and a fever accompanied with a cough. When the inflammation affects both the lobes, and the whole body of the lungs, the case is desperate. The peripneumony is distinguished into two kinds; one of which has its seat at the extremity of the pulmonary artery, and is called the true peripneumony; and the other is situated in the bronchial arteries, and is called the spurious or bastard peripneumony. The true peripneumony is often cured by a critical resolution and concoction of the morbid matter, which is either attenuated, so as to be returned into the channels in the common course of circulation, or expectorated by coughing; which may be easily known by an abatement of the symptoms, and the patient's falling into gentle breathing sweats. Copious bleeding is the most effectual remedy in the beginning of this disease; but not so proper when expectoration goes on successfully, because it sometimes suppresses it, and in that case sudorifics thicken the matter which is expectorated. The motions of nature ought to be followed: the aliment ought to be more slender and thin than in any other inflammatory disease whatsoever; common whey is sufficient to preserve the strength of the patient; relaxing aliments are proper, of which barley, and all its preparations, are the best. Diuretics that have not much acrimony are useful: and for this intention, an infusion of fennel-roots in warm water, with milk, is good. If nature relieves by a diarrhoea, without sinking the strength of the patient, it ought to be promoted by emollient clysters. But if the patient is neither relieved nor dies in eight days, the inflammation will end in a suppuration, and an abscess of the lungs, and sometimes in some other part of the body: in this case bleeding must be forbore; the diet must be mild, soft, inassating, and more plentiful; and tepid vapours should be taken into the lungs, from decoctions of proper ingredients. When, by the symptoms and time, the imposthume may be judged to be ripe, the vapour of vinegar, and any thing that creates a cough, are proper; for the sooner it is broke, the less danger will the lungs be in. In the state which is not absolutely desperate, the aliment ought to be milk, and the drink

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milk and barley-water, with gentle anodynes, that the patient may have some rest.

Spurious, or Bastard PERIPNEUMONY, a disease of the lungs, which generally arises from a heavy pituitous matter generated in the blood, and cast upon the lungs. In this disorder the patient is hot and cold by turns, is giddy upon the least motion, and complains of a rending pain of the head whenever he coughs; he vomits up every thing that he drinks; the urine is turbid and red, and the whole thorax full of pain. In this disorder the patient should be let blood from a large orifice; and then give him the following clyster, which must be repeated daily, till the symptoms evince that the lungs are relieved. Take of honey, three ounces; of nitre, one dram; one yolk of an egg; and eight ounces of barley-water; make them into a clyster. Let the patient's diet be very slender, such as weak broths, sharpened a little with orange or lemon juice; and he may drink a weak mixture of honey and water; the steams of warm water may be taken in at the mouth, and the following decoction given him: Take of the roots of fennel, two ounces; of the roots of grass, four ounces; of the leaves of pellitory, and agrimony, each an handful and a half; of the bruised seeds of white poppy, one ounce; and of liquorice, one ounce and a half; boil them, for a quarter of an hour, in two pints and an half of water; of which let the patient drink two ounces every two hours. Likewise let his legs and feet be bathed, and large blisters applied.

PERISCH, in geography, the inhabitants of either frigid zone, between the polar circles and the poles; where the sun, when in the summer-signs, moves only round about them, without setting, and consequently their shadows, in the same day, turn to all the points of the horizon.

PERISTALTIC, in medicine, a vermicular spontaneous motion of the intestines, performed by the contraction of the circular and longitudinal fibres, of which the fleshy coats of the intestines is composed; by means whereof the chyle is driven into the orifices of the lacteal veins, and the fæces are protruded towards the anus. When this motion comes to be depraved, and its direction changed, so as to proceed from below upwards, it produces what is called the iliac passion.

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PERISTYLE, in ancient architecture, a building encompassed with a row of columns on the inside: such was the hypæthre temple of Vitruvius, and such are now some basilicas in Rome, several palaces in Italy, and most cloisters of religious. Peristyle is also used by modern writers, for a range of columns, either within or without a building: thus we say, the Corinthian peristyle of the portal of the Louvre, &c.

PERTONÆUM, in anatomy, a thin, smooth, and lubricous membrane, investing the whole internal surface of the abdomen, and containing most of the viscera of that part, as it were in a bag. It lies immediately under the transverse muscles of the abdomen, and adheres to them, and also coheres with the diaphragm, and with all the viscera lodged in this part. It entirely encloses the stomach, the intestines, the mesentery, the omentum, the liver, the spleen, and the pancreas: as to the kidneys, ureters, and smaller vessels of the abdomen, it covers them only on the anterior part, and the urinary bladder only on the posterior. The peritonæum is composed of a double membrane, or lamella; the exterior one has longitudinal and slender fibres, and the interior transverse and more robust ones. There are also ligaments formed from it, viz. that which suspends the liver, and the two ligamenta lata of the uterus in women. Its processes, sent out of the abdomen, are two, and these serve to surround and inclose the spermatic vessels and the testicles. The arteries and veins of the peritonæum are supplied from the epigastric, mammary, lumbar, and diaphragmatic vessels; and the nerves are propagated from those of the diaphragm, back, loins, and os sacrum. The uses of the peritonæum are, 1. To inclose the contents of the abdomen; for when this part is dilated, rounded, or broken, they fall out of their due places, and ruptures are formed. 2. To give an external covering to almost all the parts contained in the abdomen, which are therefore generally said to have their external membrane from the peritonæum, And 3. To form the process of the peritonæum, and the tunica vaginalis of the testes.

PERITROCHIUM, in mechanics, a wheel, or circle, concentric with the base of a cylinder, and moveable together with it, about an axis. See *Axis*.

PERJURY, in law, a crime of swearing falsely, where a lawful oath is administered by one properly authorised, in

a matter relating to the issue or cause in question, whether it be a person's own wilful act, or done by the subornation of others.

In order to make an offence perjury, it must appear to be wilful and deliberate, and not done through surprise or inadvertency: it must be direct and positive, and not where a person swears as he thinks or believes: but in case a person swears to what he is ignorant of, it is a false oath, even though it should happen to be true; thus, a plaintiff caused two persons to swear to the value of goods, which they never saw, when, notwithstanding they swore what was true, it was adjudged to be perjury in them. At the common law, perjury, and the subornation of it, are punished by fine, imprisonment, pillory, transportation, &c.

PERMANENT, something that continues the same, whether in nature or situation, and other circumstances: thus air, generated by fermentation, is said to be permanent, because it continues to shew all the natural properties of common air.

Thus also those cups of flowers are called permanent, which remain after the flower-leaves are fallen.

PERNIO, in surgery, a chilblain or kibe, generally produced in the hands and feet by violent cold. Chilblains are accompanied with inflammation, heat, redness, pricking, and pain, of that limb; sometimes they are of a livid or leaden colour, and sometimes they break out with scabs, or else with chops, or slits, which afterwards penetrate deeper, and become ulcerous. The humour which they discharge is a little fetid, and nearly resembles pus or sanies; and they terminate in either dispersion, suppuration, or gangrene and sphacelus. While the chilblains are tumified and red, and the part retains its sense and motion, without any great heat and pain, the disorder is then of the mildest kind; on the contrary, when they are livid, occasion the limb to become stiff and insensible, or excite pricking pains therein, there is then danger of a worse consequence, lest it should degenerate into a gangrene, or at least a deep exulceration. There being no room to doubt but that cold is the cause of chilblains, it readily follows, that the cure must consist chiefly in restoring the blood to its former fluidity and free circulation as soon as possible; for which purpose an external as well as internal treatment is necessary. In the external treatment, the patient being exposed in a temperate air, should,

should, according to Heister, exercise his limbs as much as possible, in order to advance him still to a greater warmth or heat; but when he is too weak to exercise himself, it will be proper to bathe the parts affected with snow, or cold water; after which, when the limb becomes sensible, comfortable medicines may be applied, such as spirit of wine, either pure, or with theriaca, rock-oil, balsam of sulphur, &c. When the parts affected have been well rubbed or bathed with these, the patient may then be advanced towards the fire, or be put to bed, endeavouring afterwards to excite a gentle sweat. In the internal treatment, great service will be had from a few glasses of hot wine, wherein has been boiled some cinnamon and sugar; though it may not be improper to give with this alternately, a small quantity of some sudorific mixture. If the wine be not to be procured, good ale boiled with cinnamon, cloves, and sugar, may supply its place. It should be continued so as to keep up a sweat for a whole hour, for half an hour, or according to the several circumstances: but if the disorder is much slighter, this method is not so necessary; it may then be laid aside; though, in the opinion of Heister, it is much preferable to any other method. When chilblains tend to a suppuration, then it is proper to treat them like other abscesses.

If a patient has before been troubled with chilblains, which are used to return every year in the winter, the preservative against the disorder is to anoint the parts affected with petroleum, or oil of turpentine, before and after the severity of the winter comes on; but when the disorder has begun to shew itself again by tumour, inflammation, and pain, the heel or finger may be wrapped up in a swine's bladder, dipped in the forementioned oil, and the cold itself should always be carefully avoided by proper cloths or coverings.

PERPENDICULAR, in geometry, a line falling directly on another line, so as to make equal angles on each side, called also a normal line.

PERPENDICULAR to a *Parabola*, is a right line cutting the parabola in the point in which any other right line touches it, and is also itself perpendicular to that tangent.

PERPENDICULARITY of *Plants*, in natural history, a quality observed in all plants; which though they rise a little crooked, yet the stems shoot up, and the

roots sink down as much as possible in a perpendicular direction.

PERPETUAL, something that endures always, or for ever.

PERPETUAL MOTION, in mechanics, a motion which is supplied from itself, without the intervention of any external cause. This problem has given rise to an infinite number of schemes, which have all proved equally abortive. What has given rise to the belief of a perpetual motion is the following mechanical principle.

The momentums of the weight and power are as the quantities of matter in each multiplied by their respective celerities, and the celerities are as the distances from the center of motion, and also as the spaces passed through in a perpendicular direction in the same time; it must follow that there will be an equilibrium between the weights, when they are to each other reciprocally as the distances from the center, or as the celerities of the motions, or as the perpendicular ascent or descent in the same time; and this universally in all mechanical powers whatever, which is therefore the fundamental principle of all mechanics.—The nature of this proposition, not being understood by smatterers in mechanics, gave them occasion to imagine the possibility of a perpetual motion from one part of it, which they did not see was utterly impossible from another part of it.

What seems to promise the possibility of such a movement, is this, viz. that the momenta of equal bodies are as their distances from the center of motion. Hence, say the perpetual motion men, if a wheel were constructed of the form of that in the figure *ABCD*, (plate *XLI*. fig. 8.) with circular cells going from the inner part *EFGH* to the outer, containing equal balls, *CDEF*; then upon turning the wheel they must move towards the center *N* on one part, as the ball *E*; and from it on the opposite part, as the ball *C*; and by this means the ball *C* will have a greater momentum than the ball *F*, and so will determine the wheel to move round; and since this must be the case of all the balls *E* and *C* that come into the situation *EC*, the wheel must necessarily move continually, because it will bring two balls into that situation. It is true, were there but two balls *E* and *C*, the ball *C* would by this contrivance move the wheel one-fourth round, viz. while it descended from *C* to *D*; and by this means would raise the ball *E* to *F*,

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and there they will abide in the situation D F; but, say the men of this persuasion, two other balls, succeeded to the places E and C, will still keep the wheel moving. Yes, so they would, if the balls at D and E could be taken away the moment they come into that position, not else: for the balls C and E, in order to move the wheel, must move the balls D and F, which have equal momenta, as being at the same distance each from the center, as are the other two respectively, which is absurd by the general proposition.

The absurdity of a perpetual motion will still farther appear, if we consider that the momenta of bodies are always proportioned to the perpendicular descent or ascent to or from the center of the earth. Since, therefore, in the wheel the bodies are all equal by supposition, and the perpendicular spaces through which they descend and ascend, above and below the horizontal line or diameter A C, are equal; it follows, that an equilibrium must necessarily ensue. Thus, so far is this wheel from producing a perpetual motion, that it admits of none at all.

PERPETUITY, in law, is when an estate is intended to be so settled in law, &c. that it may not possibly be undone, or made void.

PERQUISITE, in law, any thing gotten by a man's own industry, or purchased with his money; in contradistinction to what descends to him from his father or other ancestor.

PERQUISITES of Courts, are the profits which casually accrue to a lord of the manor from his courts-baron, by fines for copyholds, escheats, heriots, amercements, &c.

PERRON, in architecture, the steps in the front of a building, raised before the doors of great houses, and leading to the first story, when raised above the level of the ground.

PERRY, a drink made of pears, in the same manner as cyder is made from apples. See *Cyder*.

The pears must be perfectly ripe, and to give the liquor a greater degree of tartness, some mix crabs with them. The best fruit for making perry, are such as are least fit for eating, as the choak-pear, boreland-pear, horse-pear, and the Barbary-pear.

PERSECUTION, any pain or affliction which a person designedly inflicts upon another; and, in a more restrained sense, the sufferings of Christians on ac-

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count of their religion. Historians usually reckon ten general persecutions, the first of which was under the emperor Nero, thirty-one years after our Lord's ascension; when that emperor having set fire to the city of Rome, threw the odium of that execrable action on the Christians, who under that pretence were wrapped up in the skins of wild beasts, and worried and devoured by dogs; others were crucified, and others burnt alive. The second was under Domitian, in the year 95. In this persecution St. John the apostle was sent to the isle of Patmos, in order to be employed in digging in the mines. The third began in the third year of Trajan, in the year 100, and was carried on with great violence for several years. The fourth was under Antoninus the philosopher, when the Christians were banished from their houses, forbidden to shew their heads, reproached, beaten, hurried from place to place, plundered, imprisoned, and stoned. The fifth began in the year 197, under the emperor Severus. The sixth began with the reign of the emperor Maximinus, in 235. The seventh, which was the most dreadful persecution that had ever been known in the church, began in the year 250, in the reign of the emperor Decius, when the Christians were in all places driven from their habitations, stripped of their estates, tormented with racks, &c. The eighth began in the year 257, in the fourth year of the reign of the emperor Valerian. The ninth was under the emperor Aurelian, A. D. 274, but this was very inconsiderable: and the tenth began in the nineteenth year of Dioclesian, A. D. 303. In this dreadful persecution, which lasted ten years, houses filled with Christians were set on fire, and whole droves were tied together with ropes, and thrown into the sea.

PERSEVERANCE, in theology, a Christian virtue, by which we are enabled to persist in the way of salvation to the end.

PERSEUS, in astronomy, a constellation of the northern hemisphere, which, according to the catalogues of Ptolemy and Tycho, contains twenty-nine stars; but in the Britannic catalogue, sixty-seven.

* **PERSEUS**, in fabulous history, was the son of Jupiter and Danae. When he was grown up, he acquired great reputation by his prudence and courage; and Minerva lending him her buckler, he slew Medusa, one of the Gorgons, and

cut off

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cut off her head. He afterwards conquered Atlas, and married Andromeda, after he had delivered her from the sea-monster; but at length innocently occasioned the death of his grandfather Achrisius; for, playing with him at the discus, or quoits, a game he had invented, his quoit bruised the old king on the foot, which turned to a mortification, of which he died. Perseus, greatly afflicted at this accident, forsook the country of Argos, and lived at Tyrintha, in whose territory he built Mycene, where his posterity is said to have reigned about a hundred years. After his death, he was taken up into the heavens; where he and Andromeda form one constellation.

PERSIA, a large kingdom of Asia, consisting of several provinces, which, at different periods, have had their particular kings. It is bounded on the north by Little Tartary, the Caspian Sea, Carasm, or Corasm, and Great Bokaria; on the south by the Persian Gulph and Sea; on the west by Turkey in Asia; and on the east by Great Bokaria and the empire of the Great Mogul. It is about one thousand two hundred and twenty-five miles from east to west, and nine hundred from north to south. It is divided into sixteen large provinces, namely, Shirvan, Aran, Adirbijan, Khilan, Masanderan, Altabad, Jorjan, Korazan, Irac-Agemi, Segestan, Candahar, Sablestan, Khufistan, Fars, Kerman, and Makran. The chief rivers, besides the Tygris and the Amu, are the Khur, Aras, Kezil, Usan, Hindmend, Ilmend, Bendamir, Karon, and Karka. No country bears a more different character than this; for in the north and east parts, it is mountainous and cold; in the middle and south-east, sandy and desert; in the south and west, level and extremely fertile, though for several months it is very hot. The soil produces all sorts of pulse and corn, except oats and rye. They have cotton in abundance, and, among other domestic animals, have camels and buffaloes; and their horses are very numerous. In several places naphtha rises out of the ground; and they have mines of torquois-stones, iron, and salt. They have almost all sorts of fruits. The Persians are Mahometans of the sect of Hali. The manufactures of Persia are embroidery, especially that of gold and silver, either in cloth, silk, or leather; and that which we call Turkey leather comes chiefly from hence; but silk stuffs are the chief

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manufacture of the country, such as taffeties, tabbies, and silk, mixed with cotton or camels and goats hair. Their brocades, gold tissue, and gold velvet, are admirable; and what we call Turkey carpets are in reality the product of Persia. They also make stuffs with camels hair, goats hair, and wool.

The Armenians and Banians of India, who reside here principally, carry on the trade to the distant countries, and may be looked upon as the greatest merchants in the world. By the permission of the czarina, the English Russia company traded through Russia, down the river Wolga, and the Caspian Sea, into Persia, where they bartered the English woollen manufactures for Persian silks, between the year 1741 and 1746; but some of the company's officers being about to build ships on the Caspian Sea, for the use of the Persians, the czarina prohibited the traffic to Persia through her dominions, and that trade is now fallen into the hands of the Armenians. Isaphan is the capital city.

PERSIAN-WHEEL, an engine, or wheel, turned by a rivelet, or other stream of water, and fitted with open boxes at its cogs, to raise water for the overflowing of lands, or other purposes.

PERSICA, the peach. See *Peach*.

PERSICARIA, in botany, a genus of arsmart plants. There is great irregularity in this genus, there being in some species only five stamina; and in others six, or eight. The mild or spotted arsmart is said to be a good vulnerary and antiepileptic: and the biring arsmart is a good stimulating medicine, and diuretic: its fresh leaves are also used by farriers for cleansing old ulcers.

PERSON, an individual substance of a rational or intelligent nature. Thus we say, an ambassador represents the person of his prince; and that in law, the father and son are reputed the same person. In theology, the godhead is divided into three persons; but here the word person is designed to convey a peculiar idea, very different from that attached to it every where else; it being only used for want of another term more pertinent and expressive.

PERSON, in dramatic poetry, the character assumed by an actor, or he who is represented by the player.

PERSON, in grammar, a term applied to such nouns or pronouns, as being either prefixed or understood, are the nominatives in all inflexions of a

verb; or it is the agent or patient in all finite and personal verbs.

PERSONABLE, in law, signifies the being able to maintain a plea in court; especially in the case of an alien, who may be made personable by act of parliament. It is also used to signify a capacity to receive any thing granted or given.

PERSONAL, any thing that concerns, or is restrained to, the person: thus it is a maxim in ethics, that all faults are personal.

PERSONAL ACTION, in law, an action levied directly and solely against the person; in opposition to a real or mixed action.

PERSONAL GOODS, or **CHATTELS**, in law, any moveable thing belonging to a person, whether alive or dead.

PERSONAL TYTHES, tythes payable out of the profits obtained by a man's personal labour and industry, as in buying, selling, handicraft, &c.

PERSONAL VERB, in grammar, a verb conjugated in all the three persons: thus called, in opposition to an impersonal verb, or that which has the third person only.

PERSONALITY, in the schools, that which constitutes an individual a distinct person.

PERSONIFYING, or **PERSONALIZING**, the giving an inanimate being the figure, sentiments, and language of a person.

PERSPECTIVE, the art of delineating visible objects on a plain surface, such as they appear at a given distance upon a transparent plane, placed perpendicular to the horizon, between the eye and the object.

The word is derived from the Latin, *perspicio*, to see plainly.

Perspective consists of two parts, speculative and practical.

The speculative part, or theory, makes a considerable branch of direct optics, in regarding the appearances of all visible objects, as they exhibit themselves to the naked eye, and reducing those appearances to mathematical rules and theorems.

The practical part is an application of these rules to the actual description of those appearances, the doing of which in a most easy and uniform manner, for all different cases, is all that can be expected from it.

But as this part is purely mathematical,

its assistance towards drawing is only what can be performed by rule and compass, and can therefore strictly serve only for finding the images of points, of which they are composed; and as these are infinite, it is endless to find them all by the strict rules; whence it becomes necessary, after a sufficient number of them are found, to complete the image by the help of drawing, to the better effecting of which these points serve as a guide. Thus, when a circle is to be described, the practical rules serve to find a sufficient number of points in the circumference; which, being neatly joined by hand, will perfect the image, so that, in strictness, nothing in this image is found by mathematical rules, save the few particular points; the rest owes its being to the hand of the drawer.

Thus also, if any complicated figure be proposed, it may not be easy to apply the practical rules to the description of every minute part, but by inclosing that figure in a regular one, properly subdivided and reduced into perspective, that will serve as a help, whereby a person, skilled in drawing, may with ease describe the object proposed: upon the whole, where the boundaries of the proposed objects consist of straight lines, and plain surfaces, they may be described directly by the rules of perspective; but when they are curvilinear, either in their sides or surfaces, the practical rules can only serve for the description of such right-lined cases as may conveniently inclose the objects, and which will enable the designer to draw them within those known bounds, with a sufficient degree of exactness.

It is therefore in vain to seek, by the practical rules of perspective, to describe all the little hollows and prominences of objects, the different light and shade of their parts, or their smaller windings and turnings; the infinite variety of the folds in drapery; of the boughs and leaves of trees, or the features and limbs of men and animals; much less to give them that roundness and softness, that force and spirit, that easiness and freedom of posture, that expression and grace which are requisite to a good picture: perspective must content itself with its peculiar province of exhibiting a kind of rough draught to serve as a groundwork, and to ascertain the general proportions and places of the objects, according to their supposed situations, leaving the rest to be finished, beautified, and

and ornamented by a hand skilful in drawing.

It is true, perspective is of most use where it is most wanted, and where a deviation from its rules would be the most observable; as in describing all regular figures, pieces of architecture, and other objects of that sort, where the particular tendency of the several lines is most remarkable; the rule and compass, in such cases, being much more exact than any description made by hand: but still the figure, described by the perspective rules, will need many helps from drawing; the capitals, and other ornaments of pillars, and their entablatures, the strength of light and shade, the apparent roundness and protuberance of the several parts, must owe their beauty and finishing to the designer's hand; but, with regard to such objects as have no constant and certain determinate shape of size, such as clouds, hills, trees, rivers, uneven grounds, and the like, there is a much larger latitude allowable, provided the general bulk, or usual natural shape of those objects, be in some measure observed, so as not to make them appear unnatural or monstrous. See the article *Drawing*.

But, although the strict practical rules of perspective are in a great measure confined to the description of right-lined figures, yet the knowledge of the general laws of that science is of great and necessary use to inform the judgment, after what manner the images of any proposed lines should run, which way they should tend, and where terminate; and thereby enables it the better to determine what appearance any objects ought to put on, according to their different situations and distances: it accustoms the eye to judge, with greater certainty, of the relations between real objects and their perspective descriptions, and the hand to draw the same accordingly; and directs the judgment readily to discover any considerable error therein, which might otherwise escape notice. Besides that, when the ground, or general plan, and the principal parts of a picture are first laid down according to the rules, every thing else will more naturally fall in with them, and every remarkable deviation from the just rules will be the more readily perceived, and the easier avoided or rectified; so that although it may be infinitely tedious, or absolutely impracticable, to describe every minute part of a picture, by the strict mechanical rules; yet the employ-

ing them, where they can be the most commodiously used, will give the picture in general such a look, as will guide the artist in drawing the other parts without any obvious inconsistency.

We shall now give such rules as are of most general use in the practice of perspective. 1. Let every line, which in the object, or geometrical figure, is straight, perpendicular, or parallel to its base, be so also in its scenographic delineation. 2. Let the lines, which in the object return at right angles from the fore-right side, be drawn scenographically from the visual point. 3. Let all straight lines, which in the object return from the fore-right side, run in a scenographic figure into the horizontal line. 4. Let the object you intend to delineate, standing on your right hand, be placed also on the right hand of the visual point; and that on the left hand, on the left hand of the same point; and that which is just before, in the middle of it. 5. Let those lines which are (in the object) equidistant to the returning line, be drawn in the scenographic figure, from that point found in the horizon. 6. In setting off the altitude of columns, pedestals, and the like, measure the height from the base-line upward, in the front or fore-right side; and a visual ray down that point in the front shall limit the altitude of the column or pillar, all the way behind the fore-right side, or orthographic appearance, even to the visual point. This rule you must observe in all figures, as well where there is a front or fore-right side as where there is none. 7. In delineating ovals, circles, arches, crosses, spirals, and cross-arches, or any other figure in the roof of any room, first draw ichnographically, and so with perpendiculars from the most eminent points thereof, carry it up unto the ceiling; from which several points, carry on the figure. 8. The center in any scenographic regular figure is found drawing by cross lines from opposite angles; for the point where the diagonals cross, is the center. 9. A ground-plane of squares is alike, both above and below the horizontal line; only the more it is distant above or beneath the horizon, the squares will be so much the larger or wider. 10. In drawing a perspective figure, where many lines come together, you may, for the directing of your eye, draw the diagonals in red; the visual lines in black; the perpendiculars in green, or other different colour, from that

that which you intend the figure shall be of. 11. Having considered the height, distance, and position of the figure, and drawn it accordingly, with side or angle against the base; raise perpendiculars from the several angles, or designed points, from the figure to the base, and transfer the length of each perpendicular, from the place where it touches the base, to the base on the side opposite to the point of distance; so will the diametrals drawn to the perpendiculars in the base, by intersection with the diagonals, drawn to the several transferred distances, give the angles of the figures, and so lines drawn from point to point will circumscribe the scenographic figure. 12. If in a landscape there be any standing waters, as rivers, ponds, and the like, place the horizontal line level with the farthest sight or appearance of it. 13. If there be any house, or the like, in the picture, consider their position, that you may find from what point in the horizontal lines to draw the front and sides thereof. 14. In describing things at a great distance, observe the proportion, both in magnitude and distance, in draught, which appears from the object to the eye. 15. In colouring and shadowing of every thing, you must do the same in your picture, which you observe with your eye, especially in objects lying near; but according as the distance grows greater and greater, so the colours must be fainter and fainter, till at last they lose themselves in a darkish sky colour. 16. The catoptries are best seen in a common looking glass, or other polished matter; where, if the glass be exactly flat, the object is exactly like its original; but, if the glass be not flat, the resemblance alters from the original; and that more or less, according as the glass differs from an exact plane. 17. In drawing catoptric figures, the surface of the glass is to be considered, upon which you mean to have the reflection: for which you must make a particular ichnographical draught, or projection; which on the glass must appear to be a plane full of squares, on which projection transfer what shall be drawn on a plane, divided into the same number of like squares; where though the draught may appear very confused, yet the reflection of it on the glass will be very regular, proportional, and regularly composed. 18. The dioptric, or broken beam, may be seen in a tube through a crystal or glass, which hath its surface cut into many others, whereby

the rays of the object are broken. For to the flat of the crystal, or water, the rays run straight; but then they break, and make an angle, which also by the refracted beams is made and continued on the other side of the same flat. 19. When these faces on a crystal are returned towards a plane placed directly before it, they separate themselves at a good distance on the plane; because they are all directed to various far distant places of the same. See *Reflection* and *Refraction*.

PERSPECTIVE also denotes a kind of painting frequently seen in gardens, at the ends of galleries, &c. expressly designed to deceive the sight.

PERSPECTIVE-GLASS in optics, differs from a telescope in this: instead of the convex eye glass placed behind the image, to make the rays of each pencil go parallel to the eye, there is placed a concave eye-glass as much before it; which opens the converging rays, and makes them emerge parallel to the eye. The quantity of objects taken in at one view with this instrument, does not depend upon the breadth of the eye glass, as in the astronomical telescope, but upon the breadth of the pupil of the eye.

PERSPECTIVE PLANE, a glass, or other transparent surface, supposed to be placed between the eye and the object, perpendicular to the horizon.

PERSPIRATION, in medicine, the evacuation of the juices of the body through the pores of the skin. Perspiration is distinguished into sensible and insensible: and here sensible perspiration is the same with sweating, and insensible perspiration, that which escapes the notice of the senses; and this last is the idea affixed to the word perspiration, when used alone. The vessels through which perspiration is performed, lie obliquely under the scales of the scurf-skin, and are so inconceivably small, that from a calculation made by Liewenhoeck, it appears that the mouths of an hundred and twenty-five thousand of them may be covered with a common grain of sand. The matter of insensible perspiration is a fine subtle fluid, which exhales from the body in the form of a vapour, and proceeds from the whole surface and from every cavity: it is of an aqueous and saline nature, and seems to have a great analogy with urine; because in a healthy state, the increase of the one diminishes the other. Many experiments prove its existence.

existence. If you pass your finger over a looking-glass, or any other polished body, it will leave a track or moisture. If you put your naked head near a white wall, exposed to the sun, the shadow of the vapours which proceed from the pores of the skin, may be plainly seen; or if you breathe upon glass, you may perceive it covered with small drops of water; and the vapours which proceed from the lungs, are in winter condensed by the cold, and form a kind of bluish mist, proceeding from the mouth. Other experiments shew that the matter evacuated this way, is at least in some countries more than equal to all the other evacuations by stool, urine, &c. Sanctorius found in Italy, under the circumstances of a moderate diet, middle age, and easy life, that the matter insensibly perspired was five-eighths of that taken in for food, so that there only remained three eighths for nutrition, and for the excrements of the nose, ears, intestines, bladder, &c. The same author shews, that as much is evacuated by perspiration in one day, as by stool in fourteen days.

But Dr. Bryan Robinson, of Dublin, has found the case very different, both in England and Ireland, and even in South Carolina, in all which places he found that the quantity of urine exceeds that of perspiration; and that if the meat and drink of one day be four pounds and a half, the perspiration of that day will be two pounds, the urine two pounds five ounces, and the stool three ounces.

The use of perspiration is to preserve the suppleness of the papillæ of the skin; to carry the saline particles off from the blood, and by this means to render it more pure; to preserve the body from various diseases, and to contribute to the cure of the most dangerous distempers. It may be promoted by exercise, by dry frictions with a coarse linnen-cloth, or a flesh-brush; by warm baths, and washing the hands, feet, head, &c.

PERU, a large country of South America, bounded on the north by Popayan, on the east by the country of the Amazons, on the south by Chili, and on the west by the South Sea; it is about fifteen hundred miles from north to south, and one hundred and twenty-five from east to west, between the Andes and the South Sea; but in other places it is much broader, and according to some, three hundred miles. It seldom rains here, and the inhabitants hardly know what

lightning and thunder is, unless towards the top of the above mountains; for while the mathematicians from France were there to measure a degree of latitude, while they were making their observations, they not only saw the lightning, but heard the thunder below them, for they were above the clouds. All the tops of these mountains are covered with snow to a great height; and there are several volcanoes which burn continually; sometimes such torrents of water will fall down from thence that will overflow the whole country. There happened one in December, 742, that in some places the flood was sixty feet high, and in others above one hundred and twenty; it carried away an infinite number of cattle, threw down six hundred houses, and drowned eight hundred persons. Some thought this water proceeded out of the rock, but others more judiciously concluded it came from the melting of the snow. The best houses in this country are made of a sort of reeds like bamboo-canes, and covered with thatch, or palm-leaves. However, they have a sort of galleries or balconies, but there is no walking along the floors without making the whole structure groan. There are large forests on the sides of the mountains, which advance near the sea-side; but none of their trees are like those in Europe. The birds that are therein are much superior to those of Europe for the beauty of their plumage, but their notes are very disagreeable. There are few birds near the sea-side, and the monkeys also get at a distance from it. It has been generally said there are lions here, but that which they call so is more like a wolf than a lion, and he never attacks mankind; but the tigers are as large and fierce as those of Africa, though not of the same colour; however, it is happy for the inhabitants that there are but very few of them. Serpents are very common, and several sorts of them are dangerous, particularly the rattlesnake. There are several insects like those in Europe, but they are vastly larger. The earth-worms are as long as a man's arm, and as thick as his thumb; likewise there are spiders covered with hair, and as large as a pigeon's egg. The bats are of a monstrous size, and will suck the blood of horses, mules, and even of men who sleep in the fields. The famous bird, called a contor or condor, is perhaps the largest in the world, for it easily carries off a sheep; and

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and some affirm it will carry off a whole buck. Peru is inhabited by the Spaniards who conquered it, and by the native Americans. These last, that live among the forests, and form as it were so many small republics, which are directed by a Spanish priest, and by their governor, assisted by other original natives, that serve as officers. They have no distrust, for they leave the doors of their huts always open, though they have cotton, calabashes, and a sort of aloes, of which they make thread, and several other small matters which they trade with, and which might be easily stolen. They go naked, and paint their bodies with a red drug, called rocu. The same man is of all trades, for he builds his own hut, constructs his own canoe, and weaves his own cloth; but if a large house is to be built for common use, every one lends a helping hand. Their skins are of a red copper colour; and they have no beards, or hair on any part of their bodies, except their heads, where it is black, long, and coarse. Those that are not much exposed to the weather are of a lighter colour than the rest. The natives who live at Quito, seem to be of a different temper; for they are all extremely idle, and will sit whole days together upon their heels, without stirring or speaking. Their garment is a sort of sack, with holes to put their arms through; and this is given them by their masters as part of their wages. From a mixture of the native Americans and the Spaniards, there arises a third kind called Mestices, who are illegitimate; however, they have all the privileges of a Spaniard, and are the persons who carry on all trades; for the Spaniards think it beneath them to meddle with any thing of this sort: these behave in a more tyrannical manner over the real Americans, than even the Spaniards themselves, inasmuch that the governor is obliged to repress their insolence. It was observed, that it seldom rains; but this must be understood of the south parts; for in the north, where the mountains are not so high, it often rains excessively, inasmuch that those who go thither in search of gold are often carried off by the unwholesomeness of the climate. Those that travel over the Andes, where they are passable, find it so cold, that they are often frozen to death. They have a great number of fruits, plants, and trees not known in Europe; however, some of their physical drugs

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are brought over, which are of excellent use, and are well known in druggists shops, particularly the Jesuits bark and Peruvian balsam. The Spaniards have introduced many herbs, plants, and trees from Europe, which thrive here very well, and the fruits they produce are very delicious. This country is divided into five great audiences, which are Quito, De los Reyes, and De las Charchas, which will be taken notice of in their proper places. The immense riches, produced by the mines of gold and silver in Peru, have been so often mentioned, that it would be unnecessary to enlarge upon it here.

PEST-HOUSE, the same with lazaretto or lazar-house.

PESTILENCE, in medicine, an epidemical, contagious, and malignant disease, popularly known by the name of plague.

PESILENTIAL FEVERS, such as are attended with some malignant quality, and approach to the nature of the plague.

PETAL, among botanists, an appellation given to the flower-leaves, in opposition to the folia, or common leaves of the plant. According to the number of petals in each flower it is said to be monopetalous, or to consist of a single petal; dipetalous, when it has two; tripetalous, when three, &c. See *Flower*.

PETARD, in the art of war, a metalline engine, somewhat resembling a high crowned hat.

The petard may be considered as a piece of ordnance. It is made of copper mixed with brass, or of lead with tin; and its charge is from five to six pounds of powder. Its use is in a clandestine attack to break down gates, bridges, barriers, &c. to which it is hung; and this it does by means of the wooden plank. It is also used in countermines to break through the enemy's galleries, and give their mines vent. The invention of petards is ascribed to the French Huguenots, in 1579, who with them took Cahors, as D'Aubigné tells us.

PETARDEER, one who loads, fixes, and fires petards.

PETECHIÆ, in medicine, denote spots in the skin like flea-bites, which come out in malignant fevers, hence called petechial, or spotted fevers.

PETER, or *Epistles of St. PETER*, two canonical books of the New Testament, written by St. Peter, and addressed

addressed to those Jewish converts who were scattered throughout Pontus, Galatia, &c. not only upon the persecution raised at Jerusalem, but upon former dispersions of the Jews into those places. The first of these epistles is principally designed to comfort and confirm them under those fiery trials they were then subject to; and to direct them how to behave in the several states and relations, both of the civil and the Christian life. In the second epistle, the apostle prosecutes the same subject, to prevent their apostacy from the faith, and guard them against the corrupt principles of the Gnostics, and those who scoffed at the promise of Christ's coming.

* **PETER** (St.) one of the apostles, was born at Bethsaida in Gallilee, and was first named Simon; but Christ having called him to be an apostle, changed his name to that of Cephas, which is the same with Peter; for while he was fishing on the lake of Genazereth, with Andrew his brother, the son of God ordered them to leave their nets and to follow him, and from that time they continued his disciples. He was a witness to our Lord's transfiguration on the mount; he was present at the last supper, and in the garden when the soldiers came to seize Jesus, where being transported with zeal, he drew his sword, and cut off the high-priest's servant's ear. St. Peter then denied his knowing his Lord, and persisted in it three times, till the cock-crowing, reminded him of Jesus's having foretold this instance of his weakness, on which he shewed his repentance by his tears. St. Peter was likewise a witness of Christ's resurrection and ascension, and of the descent of the Holy Ghost. He afterwards zealously preached the gospel; converted three thousand persons at his first sermon, and performed many surprising miracles in proof of his divine mission. Some time after Herod Agrippa caused him to be imprisoned at Jerusalem, whence he was delivered by an angel. He afterwards opposed St. Paul at Antioch, and suffered martyrdom, being, according to some, killed in prison, and, according to others, crucified with his head downwards. He wrote two Epistles, addressed to the converted Jews dispersed throughout Asia.

* **PETERBOROUGH**, an episcopal city of Northamptonshire, with a market on Saturdays; and two fairs, on July 10, and October 2, for horses, all kinds of stock, and wrought timber. It is seated

on the river Nen, which is navigable for barges, over which there is a bridge to pass into Huntingdonshire. The cathedral is a stately structure, with a venerable front, and large cloisters, and St. Mary's chapel is a handsome large building, full of curious work, with a large choir. Here the queens Catharine of Spain and Mary of Scots, lie interred. This place is of no great extent, and has but one parish church besides the cathedral. It sends two members to parliament, and the mayor, recorder, and other officers of the city, are elected by the dean and chapter. It is thirty-eight miles south of Boston, and eighty-one north-by-west of London. Long. $0. 15. W.$ Lat. $52. 33 N.$

* **PETERSBURG**, a large city of Russia, and the capital of the whole empire, built by Peter the Great, czar of Muscovy, in 1703. It is of prodigious extent, and contained not long ago 60,000 houses. It is seated in an island, in the middle of the river Neiva, where the land has been considerably raised. The fort, has six bastions, and opposite to it, on Terre Firma, is a crown work. The fort has two gates, at the entrance of which is the figure of the czar holding two keys, and within is a black eagle crowned, holding in his claws a sceptre, and an imperial globe. A little farther is the chapel of St. Nicholas, the chief patron of Russia. Within this fort, or citadel, is the church of St. Peter and St. Paul, with a high steeple, and is designed for the burying-place of the royal family. In an arm of the river, between the crown work and the fort, the emperor's galleys are laid up during the winter season. On this side the fort there are two quarters, called the Slabod of the Germans, and the Slabod of the Muscovites. In the first there are the summer and winter palaces, the houses belonging to the admiralty, a church, and a dock for building ships; in the other Slabod is the palace of the empress, where she formerly resided. Beyond the forts are the Slabods of the Tartars and Finlanders; and in both there are very superb structures. In 1716 they began to cut canals in the island, to make Petersburg resemble Amsterdam; but the czar did not live to see this project executed. There are built here many palaces, a college, a military school, and an exchange. This place is not high enough to escape inundations, which sometimes have occasioned the loss of vast sums of money.

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money. When the merchants perceive a flood is coming on, they make dykes before their houses, to keep out the water. At first provisions were scarce, and the trade was small, because the lakes Ladoga and Onega had not depth enough to carry large vessels; but Peter the Great remedied this inconveniency in 1710, by cutting a canal from the lake Ladoga, of about seventy-five miles in length, seventy feet wide, and ten in depth. Ten years were employed in this work, but it was not finished till the next reign; and thus Petersburg may readily be supplied with provisions. Trade flourishes greatly here, because it is the seat of the sovereign, and because foreigners have the same privileges as the natives of the place. All religions are tolerated, and there are packet-boats, by which intelligence is conveyed to different places. The inhabitants also carry on a trade by land with the Chinese and Persians. They have woollen and linen manufactures here, paper-mills, powder-mills, places for preparing salt-petre, brimstone, and laboratories for fire-works. Here are also yards for making ropes, cables, and tackling for ships; a foundery, where cannon and mortars are cast; as also a printing house. A road is made between Petersburg and Moscow, in a strait line across the forests, planted with trees on each side, and which is 355 miles in length. It was finished in 1718; and at the end of every five miles there are posts eight feet high set up to direct travellers. Some streets of this city are regular and well built; and among the most elegant structures may be reckoned the great chancellor's house, that of the vice-chancellor, count Gallowin's, and some others. They are mostly brick plastered over; and though the climate is so very cold, yet they have more windows than they generally have in England. An Italian architect, who settled here many years, contributed not a little to the beauty of the city. The summer palace, and gardens lie to the east, where there are fine walks, and choice statues. Near it is the theatre, which was erected in the room of a wooden one, burnt down to the ground. It is 355 miles north-west of Moscow, 750 north-east of Vienna, and 1250 north-east of Paris.

St. PETER'S DAY, a festival of the Christian church, observed on the twentieth of June.

PETER-PENCE, an ancient tax of

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a penny on each house, paid to the pope.

PETITIO PRINCIPII, in logic, the taking a thing for true, and drawing conclusions from it as such; when it is really false, or at least wants to be proved, before any inferences can be deduced from it.

PETITION, a formal supplication or request made by an inferior to a superior, especially to one having some jurisdiction.

PETRE, or **SALT-PETRE**, the same with nitre. See *Nitre*.

PETRIFICATION, in physiology, the conversion of wood, bones, and other substances into stone.

PETROLEUM, also called oil, or oil of petre, an extremely subtle and penetrating fluid, and is by much the thinnest of all the native bitumens. Petroleum is found in rivers, in wells, and trickling down the sides of hills along with little streams of water. In short, it is the most frequent of all the liquid bitumens, and is perhaps the most valuable of them all in medicine. It is to be chosen the purest, lightest, and most pellucid that can be had, such as is of the most penetrating smell, and is most inflammable. It is principally used externally, in paralytic cases, and in pains of the limbs.

PETROSA OSSA, in anatomy, a name given to the fourth and fifth bones of the cranium, called also ossa temporum, and ossa squamosa; the substance whereof, as their first and last names express, is squamose and very hard.

PETTY-BAG, an office in chancery, the three clerks of which record the return of all inquisitions out of every county, and make all patents of comptrollers, gaugers, customers, &c.

PETTY-FOGGER, a little tricking solicitor or attorney, without either skill or conscience.

PEWTER, a fictitious metal, used in making domestic utensils, as plates, dishes, &c. The basis of this metal is tin, which is converted into pewter, by mixing an hundred weight of tin with fifteen pounds of lead and six pounds of brass. Beside this composition, which makes the common pewter, there are other kinds compounded of tin, regulus of antimony, bismuth and copper, in several proportions.

PHÆNOMENON, in philosophy, an extraordinary appearance in the heavens, or

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or earth, either by observation of the celestial bodies, or by physical experiments, whose cause is not obvious. Such are meteors, comets, earthquakes, effects of the magnet, &c. Sir Isaac Newton shews, that all the phenomena of the heavenly bodies follow from the attraction of gravity, and almost every phenomenon of the lesser bodies from the attraction and repulsion between their particles. See *Attraction*.

* **PHAETON**, in fabulous history, the son of Apollo, and the nymph Clymene. Having a dispute with Epaphus, the son of Jupiter and Io, the latter upbraiding him, said, that he was not the son of Phœbus, but that his mother made use of that pretence to cover her infamy. Phaeton fired at this reproach, flew to his mother, and by her advice complained to Apollo, who received him with great tenderness, and swore by the Styx to grant whatever he requested, as a proof of his acknowledging him for his son. The youth boldly requested the direction of the chariot of the sun for one day. His father, grieved and surprized at this demand, used all his arguments to dissuade him from the rash attempt; but in vain, and being by his oath reduced to submit to his obstinacy, entrusted him with the reins, after directing him how to use them. The young adventurer was however soon sensible of his folly. He was unable to guide the fiery steeds, and losing the reins, Jupiter, to prevent his consuming the heavens and earth, struck him with a thunderbolt, and hurled him from his seat into the river Eridanus or Po. His sisters Phaethusa, Lambetia, and Phœbe, lamenting his loss upon its banks, were changed into black poplar trees, and Cycnus, king of Liguria, also lamenting his fate, was transformed into a swan. Many have considered it as a fable intended to shew the effects of rash presumption and obstinacy in young people, who refuse to be guided by those whose wisdom and authority ought to regulate their actions.

PHAGEDÆNA, *φαιδαίνα*, in surgery, a corroding ulcer.

PHAGEDÆNIC MEDICINES, those used to eat off fungous or proud flesh; such are all the caustics.

PHALANX, in Grecian antiquity, a square battalion, consisting of eight thousand men, with their shields joined, and pikes crossing each other; so that it was next to impossible to break it.

* **PHALANX**, in fabulous history,

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an Athenian whom Pallas instructed in the art of war, at the same time that she instructed his sister, Arachne, in sewing and weaving; but Phalanx committing incest with his sister, Pallas transformed them both into vipers, and for a further punishment, ordering that the young ones should eat their way through the body of the female.

PHALEUCIAN VERSE, in ancient poetry, a kind of verse which consists of five feet, the first of which is a spondee, the second a dactyl, and the three last trochees.

PHANATIC, a term of reproach formerly given to the dissenters, from a false supposition that they pretended to visions, &c.

PHANTASTIC STYLE, in music, denotes a free and easy manner of composition, proper for instruments.

PHANTASY, or **FANCY**, the same with imagination.

* **PHAON**, in fabulous history, was born at Mitylene, in the island of Lesbos, and received from Venus an alabaster box of rich ointment, by rubbing himself with which he became handsomer than the rest of mankind. The women and girls of Mitylene became distractedly in love with him, and Sappho, the celebrated poetess, being unable to prevail on him to return her passion, in a fit of distraction cast herself headlong into the sea. After which, Phaon being caught in adultery, was slain.

PHARMACEUTICA, pharmaceutics, that part of medicine, which gives the description of remedies, and teaches the method of rightly exhibiting them.

PHARMACOPOEIA, a dispensary, a treatise describing the preparations of the several kinds of medicines, with their uses, manner of application, &c.

PHARMACOPOLA, an apothecary, or one who prepares and sells medicines.

PHARMACY, the art or science which teaches the choice, preparation, and mixtures of medicines; constituting one part of the therapeutic branch of medicine, the objects of which are all natural bodies.

PHARYNX, in anatomy, the upper part of the œsophagus. See *Œsophagus*.

PHASES, *φάσεις*, in astronomy, the several appearances or quantities of illumination of the moon, Venus, Mercury, and the other planets; or the several manners wherein they appear illuminated by the sun.

PHEASANT, *Phasianus*, in ornithology,

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thology, a genus of birds of the order of the gallinæ, with the space about the eyes naked, and no wattles.

PHELLANDRIUM, **WATER-HEM-LOCK**, in botany, a genus of plants.

PHEONS, in heraldry, the barbed heads of darts, arrows, or other weapons.

PHIAL, a small thin glass bottle, vulgarly called a vial.

* **PHILADELPHIA**, the capital city of Pennsylvania, in North America, in a county of the same name. It is of an oblong square, two miles in length, and one in breadth; and the high street runs from the middle of one front to another. In the center of the town is a square of ten acres, surrounded by the town-house and other public buildings. The high street is 100 feet wide, and parallel to it there are eight streets, which are crossed by twenty more at right angles, all of them being thirty feet wide. It is seated between the rivers Delaware and Schuylkill, which are close to it at each end; and there is a fine quay next to the Delaware, to which ships of 4 or 500 tons may come up. There are wet and dry docks for building and repairing ships, magazines, warehouses, and all manner of conveniences for importing and exporting merchandizes. The houses are chiefly built with brick. The town-house was erected in 1732, in which there are large rooms for the assembly and supreme court. The public offices are kept in the wings. The other public buildings are, the court-house, two Quakers meeting-houses, two for the Presbyterians, and one for the Baptists. There are also a church for the English service, one for the Dutch Lutherans, one for the Dutch Calvinists, and one for the Moravians, besides a mass-house, an academy, a Quakers school-house, the city alms-house, the Quakers alms-house, the hospital, the prison, and the workhouse. Long. 74. 6 W. Lat. 40. 50. N.

PHILIPPICS, in literature, a name given to the orations of Demosthenes against Philip king of Macedon; being esteemed the master-pieces of that great orator. Philippic is also a term applied to the fourteen orations of Cicero against Mark Antony.

* **PHILIPS**, **AMBROSE**, an eminent poet, was descended from an ancient family in Leicestershire, and educated at St. John's college, Cambridge, where he wrote his pastorals, which were much

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admired by Sir Richard Steele, and which Gildon, in his Art of Poetry, ranks with those of Theocritus and Virgil. When he left the university he repaired to London, where he became acquainted with the wits, and Sir Richard inserted in the Tatler his poem called a Winter-piece. Sir Richard mentions it with honour; and Mr. Pope, who had an aversion to Philips, when he affected to despise his other works, always excepted this out of the number. After the accession of king George I. to the throne, Mr. Philips was made justice of the peace. In the mean time, having incurred the displeasure of Mr. Pope, he satirized him with his usual severity. This is said to have been owing to his mentioning Mr. Pope as an enemy to the government. Mr. Philips, unable to use the lash of satire against so expert a master of that weapon, had recourse to another, and stuck up a rod at Button's coffee-house, with which he threatened to chastize his antagonist whenever he should meet him there: but Pope prudently declined coming to a place where he must have felt the resentment of an offended author. Mr. Philips wrote three tragedies, the Distressed Mother, Humfrey Duke of Gloucester, and the Briton. At length his friend, Dr. Boulter, being made archbishop of Armagh, he accompanied him into Ireland, where he obtained considerable employments, and became a representative in parliament for the county of Armagh. In 1748 he returned to London, but soon after died at his lodgings near Vauxhall. He was far from being so contemptible a poet as Mr. Pope (from resentment) endeavoured to represent him.

PHILLYREA, or **PHYLLYREA**, in botany, a genus of plants. The leaves and bark of this shrub are said to be astringent, and good in ulcers of the mouth; but they are little regarded in the present practice.

PHILOLOGY, an assembly of several sciences, consisting of grammar, rhetoric, poetry, antiquities, history, and criticism. It is a kind of universal literature conversant about all the sciences, their rise, progress, authors, &c. being what the French call the belles lettres. It is called in the universities, *humanities*, or *literæ humaniores*.

PHILOSOPHER, one well versed in philosophy, or who applies himself to the study of nature and morality. The word

word is formed from the Greek, φιλοσοφία, which is compounded of φιλος, a lover, and σοφία, wisdom.

PHILOSOPHERS STONE, in alchemy, a long-sought-for preparation, which is to transmute or exalt impurer metals, such as tin, lead, and copper, into gold and silver. There are three ways whereby the alchemists have attempted to arrive at the making of gold; the first by separation, the second by maturation, and the third by transmuting or turning of all metals readily into pure gold, by melting them in the fire, and casting a little quantity of a certain preparation into the fused matter, upon which the fæces are volatilized and burnt, and the rest of the mass turned into pure gold. Whether this third method be possible, is very hard to say. One natural argument will suffice to shew the vain pretences of making gold by art. Very plain receipts have been laid down on this subject, but, after ten thousand experiments according to these directions, they have always failed of success; or, if there was any little gold found, the quantity was so small, that it did not near answer the trouble and expence, nor give any encouragement to repeat the operation.

PHILOSOPHIC, or **PHILOSOPHICAL**, relating to philosophy.

PHILOSOPHICAL EGG, among chemists, a thin glass body, or bubble, of the shape of an egg, with a long neck or stem, used in digestions.

PHILOSOPHY, φιλοσοφία, the knowledge or study of nature and morality, founded on reason and experience. Philosophy, among the ancients, was used in various senses: for, 1. It sometimes was taken for universal knowledge, viz. of all things human and divine. 2. In a stricter notion, for the contemplation of nature only. 3. Sometimes for ethics, or the doctrine of manners, which we call moral philosophy. 4. It included also the mathematical arts and discipline, especially arithmetic and geometry. 5. The doctrine of existence, or *being* in the abstract, called metaphysics. 6. For the knowledge of the prime or chief good, viz. God; and this was their *prima philosophia*, or theology. 7. It was sometimes applied to logics or dialectics, which gave rules for reasoning about the nature of things.

Philosophy may be divided into three parts, intellectual, moral, or physical. The intellectual part comprizes logics and

metaphysics; the moral part contains the laws of nature and nations; and, lastly, the physical part comprehends the doctrine of bodies animate or inanimate. These, with their various subdivisions, will take in the whole of philosophy. See *Logic, Metaphysics, Ethics, Politics, &c.*

PHILTER, FILTER, in pharmacy. See *Filter*.

PHILTER, or **PHILTRE**, φιλτρον, is more particularly used for a love potion or medicine to excite love.

PHIMOSIS, in medicine, a disorder of the penis, in which the prepuce is rendered so strict or tense, that it cannot be drawn back over the glans. The general cause of a phimosis is rightly ascribed to impure coition; for while the virulent matter which had been lodged in the sinuses of the vagina, continues between the skin and glans, the prepuce, especially if it be long or tight, can hardly escape being swelled with an inflammation, and a phimosis must be induced. Some, however, have the foreskin naturally so long, and so straight, that the glans can either be not at all, or very little uncovered; but as this neither occasions trouble in discharging the urine, nor any impediment in procreation, it requires no aid from the surgeon, unless it be attended with inflammation, violent pain, or any remarkable inconvenience in coition.

PHLEBOTOMY, in surgery, the opening a vein with a proper sharp-edged and pointed instrument of steel in order to let out a proper quantity of blood, either for the preservation or recovery of a person's health. Phlebotomy, or bleeding, appears to be not only one of the most useful, but one of the most ancient operations in surgery, and is frequently performed in different parts of the body, as the foot, the forehead, temples, neck, tongue, penis, and the other parts, yet is most generally performed in that vein of the inside of the arm, which lies near the joint of the cubit.

The surgeon having tied on a fillet, about a hand's breadth above the bend of the cubit; and the veins being compressed and enlarged, by the blood's being stopped in its return, he is to examine which vein lies fairest, and is therefore most proper to be opened. In the arm are three principal veins; the first or uppermost of which is called the cephalic vein, the undermost the basilic vein, and that in the middle the median. And here it

is observed, that the median and basilic veins, as they are larger than the cephalic, discharge a greater quantity of blood, but are attended with more danger in the operation; for a considerable artery and the brachial nerve lie under the basilic vein, and the tendon of the biceps muscle under the median; but as they lie fairer to the eye, it is safer for the unexperienced surgeon to open the cephalic, or at least the median vein, but sometimes the veins are so situated as to deprive him of all choice. When the veins are not risen, it will be proper to rub the arm below the bandage, to drive up the blood, and render the veins more turgid; while this is doing, the surgeon should lay his thumb on the vein he intends to open, to prevent the blood from flowing back, and to keep the vein from rolling; and then holding the lancet, so that the thumb and first finger may be fixed about the middle of the blade, the other fingers should rest gently upon the patient's arm, to prevent his hand from slipping. The lancet is now to be pushed lightly and carefully forward by the thumb and forefinger, till it has penetrated through the coats of the vein, and at that instant to be raised a little upwards in order to enlarge the orifice of the wound, and give a freer passage to the blood. When there seems to be a sufficient quantity of blood discharged, the ligature must be immediately taken off, from above the elbow, and the skin about the orifice must be gently pressed together, by which means the lips of the divided vein are easily closed, and the little blood that may remain between the orifice and the vein discharged: one or two compresses are then put on, which the surgeon presses gently on the orifice with his left thumb, till the bandage is laid across it, which is afterwards fastened by turning it round the arm, both above and below the elbow, and tying both together.

In bleeding in the foot, it must be observed, that the veins proper for this operation, are the saphena and cephalica, the last of which extends itself from the internal ancle to the great toe; and the first, from the external malleolus to the smaller toes: bleeding in each of which is attended with the same effect: but if the veins upon the metatarsus, or instep, do not fully appear, it may be convenient to open one of those at the ancle, or about the calf or ham of the leg, where the phlebotomy is not so liable to injure any of the tendons, as in the metatarsus.

For the more easy appertion of these veins, the patient must first wash both feet in warm water; and the surgeon having fixed upon the particular foot and vein, which appears most turgid, he applies a ligature about two fingers breadth, above the ancle, or where he intends to open the vein, and puts it in the warm water again, while he takes out his lancet. Then kneeling down on one knee, he takes out the foot, and it being wiped dry, places it on the other knee, or upon a board laid over the vessel of warm water, and, securing the vein from slipping with the thumb of his left hand, makes the orifice; but if the patient does not bleed freely, puts the foot again in the warm water, till he judges by its colour, and the strength of the patient, that a sufficient quantity of blood has been drawn: the orifice is then to be closed by the thumbs, and, after drying the foot with a napkin, to be secured by compresses and a bandage.

In bleeding in the jugular veins of the neck, a stricture must be made round the lower part of the neck, with a neck-cloth or handkerchief, or the common ligature, to make the vein turgid or conspicuous, and then either of the jugular veins being secured by the thumb, the incision must be made, and the requisite quantity of blood being taken away, the ligature must be removed, and the orifice compressed with the thumb, if the blood does not stop without, while the neck is wiped clean; after which the compress and circular bandage must be applied. It is to be observed, that if the disorder lies in the whole head, or in the neck and fauces, the orifice may be made either in the right or left side indifferently; but when only one side of the head, or one eye is affected, the vein ought to be opened on that side on which the disorder lies.

In bleeding in the veins of the forehead, temples, and occiput, a stricture must be made round the neck, and the same method used as in opening the jugular veins; only observing that the patient must hold down his head, to prevent the blood trickling into his eyes, &c.

In bleeding in the veins called ranula, under the tongue, a stricture must be made round the neck, as before; you then elevate the apex of the tongue with your left hand, while with the lancet in your right hand, you circumspectly open first one, and then the other, on each side; because the appertion of one only

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will hardly ever discharge blood enough to give any considerable relief. When you judge that a sufficient quantity of blood has run out of the mouth into the vessel, remove the ligature from the neck, upon which the flux usually stops of itself: but if it should still continue, let the patient take a little vinegar or Frontinac wine in his mouth, and hold it there till the hæmorrhage ceases, which cannot be dangerous, even without such topics. In bleeding in the vena dorsalis penis, which runs along the upper side of the penis, and is generally pretty much distended, and conspicuous in an inflammation of this part, it is to be observed that it must be opened about the middle, and kept bleeding till the member becomes flaccid, and a sufficient quantity of blood is discharged: which done, you must apply a compress, and the bandage proper for the penis. But you must carefully endeavour to avoid injuring the arteries or nerves which enter the penis near this vein; as also not to make your bandage too strict; for by this means, the inflammation and symptoms may turn out worse than before.

PHLEGM, in the animal economy, one of the four humours whereof the ancients supposed the blood to be composed. See *Blood*.

PHLEGMATIC, among physicians, an appellation given to that temperament, or habit of the body, wherein phlegm is predominant; which gives rise to catarrhs, coughs, &c.

PHOCA, the sea-calf, in zoology, a genus of quadrupeds of the order of the feræ: the fore-teeth in the upper jaw are six, those in the under jaw are only four; the feet have each five toes, and are palmated, and made for swimming: there are no ears.

PHOENIX, in astronomy, one of the constellations of the southern hemisphere unknown to the ancients, and invisible in our northern parts. This constellation is said to consist of thirteen stars. It took its name from that of a bird famous among the ancients, but generally looked upon by the moderns as fabulous. The ancients speak of this bird as single, or the only one of its kind: they describe it as of the size of an eagle; its head finely crested with a beautiful plumage, its neck covered with feathers of a gold colour, and the rest of its body purple, only the tail white, and the eyes sparkling like stars; they hold that it lives 5 or 600 years in the wilderness; that when

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thus advanced in age, it builds itself a pile of sweet wood and aromatic gums, and fires it with the wasting of its wings, and thus burns itself; and that from its ashes arises a worm, which in time grows up to be a phoenix.

PHOENIX, the great palm, or date-tree, in botany.

PHOLAS, a shell-fish of the multi-valve kind, composed of five pieces, three of which are very small, so that they seem to a superficial observer to be made up of only two shells. The animal inhabiting the pholas is called *techa*. They inhabit holes made in stones, and other solid bodies, as corals, the bottoms of ships, &c. whence all shell-fish living in this manner have been commonly called pholades, since there are muscles and chame found lodged in the same manner.

PHOSPHORUS, in physiology, a denomination given to all bodies which shine and seem to burn, without having any degree of heat. Chemistry, says Dr. Shaw; hath scarce afforded any thing more surprising than the common phosphorus. To see letters traced with this matter become luminous in the dark, images and the bodies of men to blaze with light, and abundance of the like experiments performed by means of phosphorus, must awaken the curiosity of those who have seen these experiments, and render them desirous of being acquainted with the method of preparing it. The preparation, even to this day, is kept as a secret in few hands, and the matter sold at a very great price; whence we apprehend it would be no unacceptible present to the world; to render this commodity cheaper, and discover its farther uses.

The successful method of preparing the phosphorus of urine is this: evaporate any quantity of fresh urine over a gentle fire, to a black and almost dry substance; then, with two pounds thereof, thoroughly mix twice its weight of fine sand; put this mixture into a strong coated stone long-neck, and having poured a quart or two of clear water into a large receiver, join it to the long-neck, and work it in a naked fire: let the heat be small for the first two hours; then increase it gradually to the utmost violence; and continue this for three or four hours successively: at the expiration of which time there will pass into the receiver a little phlegm and volatile salt, much black and fetid oil, and lastly, the matter of phosphorus in form of white clouds,

clouds, which either stick to the sides of the receiver, like a fine yellow skin, or fall to the bottom in form of small sand. Now let the fire go out, but let the receiver continue till all be cold, lest the phosphorus take fire on the admission of the air. To reduce these small grains into one piece, put them into a little tin ingot-mould, with water; heat the ingot to make the grains melt together; then add cold water, till the matter is congealed into one solid stick, like bees-wax; which being cut into small pieces, fit to enter the mouth of a vial, may be preserved by water, and keeping the glass close stopped. If the glass were not to be stopped, the phosphorus would turn black on its surface, and at length be spoiled.

The cautions required to make this process succeed, are, 1. To evaporate the urine while it is recent. 2. To prevent its boiling over, and by that means losing the most unctuous part. 3. To let the matter afterwards ferment in the cold. 4. To mix the black matter with the sand, to prevent its melting and running over. 5. To use a stone long-neck, those of earth being too porous, and suffering the phosphorus to transude sooner than pass into the receiver. 6. To have the receiver very large, and with a very long neck, to prevent its breaking and overheating, which would either evaporate the white vapour wherein the phosphorus consists, or else prevent its coagulating. 7. To put water into the receiver for keeping it cool, and quenching the phosphorus, as it falls to the bottom. 8. To make the fire small at first, that the long-neck may be preserved, and the black matter gradually dried; which would otherwise swell and run over in a black froth. 9. Lastly, it is found necessary, that the urine for the operation be of such as drink malt-liquors rather than wine. All these circumstances being required for obtaining the phosphorus to advantage, it is no wonder that so many of those who attempted it miscarried.

This operation may be greatly shortened, by freezing and concentrating fresh urine; afterwards evaporating it with care; then digesting it in the manner above mentioned. When thoroughly digested, commit the matter, in a large quantity, to an iron pot, with an earthen head, as the chemists usually do for making spirit of hartshorn, or the spirit and salt of urine: and when, by this

method, all the salt and oil are obtained, let the caput mortuum be taken out, and mixed with twice its own weight of alum. The matter may now be put into well-coated long-necks, and worked with care in a reverberatory furnace, into very large receivers filled with water and connected to the long-necks by adopters: the lower ends whereof may enter the water, as in distilling of quicksilver; the operation being continued eight or ten hours. And this is apprehended to be the best way hitherto known of procuring phosphorus to advantage.

PHRASE, in grammar, a manner of speech peculiarly adapted to certain occasions, arts, languages, &c. Sometimes the word phrase is used for a short sentence.

PHRASEOLOGY, in matters of literature, a collection of the phrases and elegant expressions, in any language.

PHRENETIC VESSELS, in anatomy, the nerves, arteries, and veins which are spread over the diaphragm.

PHRENSY, *phrensis*, in medicine, an inflammation of the membranes of the brain, attended with an acute fever and delirium. This disease, says Arbuthnot, requires the speediest applications of all others; profuse hemorrhages of the nose often resolve it; and copious bleeding in the temporal arteries is the most efficacious remedy. The diet should be watery-gruel acidulated; and the drink barley-water, small beer, or the decoction of tamarinds. According to Boerhaave, varices of the veins, or the bleeding piles, are beneficial; a looseness is likewise good; and a violent cough, or hemorrhage, often put an end to the disease. He therefore advises plentiful bleeding through a large orifice, or to open several veins at the same time, as the jugular, frontal, and a vein in the foot.

Hoffman, from experience, prefers bleeding at the nose, procured by thrusting up a straw, a pen, or a skewer. But if this disease proceeds from a suppression of the lochia or menses, speedy and copious bleeding in the foot is necessary; and if from a stoppage of the bleeding piles, leeches must be applied to the hemorrhoidal veins. After bleeding, cathartics are proper; among which the following is preferable to all others; take of manna, four ounces; of cream of tartar, two drams; of nitre, half a dram; of oil of sweet almonds, an ounce; all which are to be taken in a pound of whey. The drink also should be fresh whey. Emul-

sions of the four cold seeds with barley-water, adding to every quart two scruples of nitre, are also convenient.

Externally, warm baths are proper for the feet; or linen-cloths may be dipped in hot-water, and applied to the feet. But especially let the head be shaved all over, and embrocated with a mixture of the best vinegar, two ounces; camphorated spirit of wine, two drams; purified nitre, two scruples; and oil of rhodium-wood, twenty drops. Antiphlogistic clysters are also proper.

But if all these means fail, recourse must be had to cupping in the lower parts, to opiates and mild blisters: though Hoffman thinks the two latter hurtful; and Boerhaave advises the physician to consider well, if the case be symptomatical, how far the foregoing method, or any part of it, is consistent with the primary disease.

PHTHIRIASIS, in medicine, the pedicularis morbus, or lousy disease, is most incident to children, though adults are not wholly exempt from it. Cleanliness and wholesome food are best for preventing this disorder, which may be cured by washing the body with a lixivium of wormwood, staves-acre, lesser centaury, and oak ashes; adding some common salt. All the bitters, four and salt things, are here recommended; as is also mercury, which infallibly destroys these vermin; but it ought to be used with great caution, even by adults, and should never be used in applications to children.

PHTHISIS, a species of consumption arising from an ulcer of the lungs. See *Consumption*.

The signs of an approaching phthisis, according to Morton, is a dry cough, which may continue for some months; whereas a simple catarrh is attended with spitting, and is but of short duration. Vomiting, or a disposition to vomit after eating, excited by the above-mentioned cough, is a most certain sign of a phthisis. In the first stage of a consumption, when the patient is afflicted with a continual cough, especially in the night time, the desfluxion upon the lungs is to be stopped by bleeding, by repeated draughts of oxymel of squills and oil of sweet almonds, of each an ounce, to be taken in large draughts of posset-drink; after which an opiate, made of two ounces of the simple alexiterial water, half an ounce of simple cinnamon-water, and six drams of the syrup of poppies will be proper; or the patient may take six or ten of the

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storax pills. It will also be convenient to carry down the impurities by stool, with a gentle cathartic. Diaphoretics likewise are not to be neglected; nor must those remedies that soften, lubricate, thicken, and concoct the phlegm be omitted; as sugar-candy, barley-sugar, old conserve of roses, liquorice-juice, the white and black troches of the London-dispensatory, fresh butter in water gruel, oil of sweet almonds, and especially linseed oil cold drawn, of which the patient may take a spoonful every hour, unless there is a diarrhoea, or other symptom that forbids it. He may also eat raisins and figs, and use the other medicines commonly prescribed for coughs. See *Cough*.

In the second stage, when the vomica is formed, but not suppurated, evacuations of all kinds are pernicious. The patient should continue the use of the pectoral medicines, and especially the balsamic pills, milk-diet, and the chalybeate-waters; of which he should drink only four, or at most six pints in a day, and a little at a time: and this course should be continued for several years.

But whether a milk diet be used alone, or mixed with mineral waters, Hoffman thinks it highly necessary to attend to the following particulars: 1. We ought diligently to enquire whether the strength of the stomach is sufficient to digest and again expel this species of medicine. 2. It is expedient that, before the use of the milk, the primæ viæ should be well cleansed from viscid and acid humours; which intention is most effectually answered by a laxative infusion of manna, whose virtue is augmented by adding a sufficient quantity of tartar. 3. On the first days, it is expedient every morning about six or seven, and every afternoon, about five o'clock, to drink six or eight ounces of women's or asses-milk, and afterwards gradually to increase the quantity. 4. After the patient has for six or eight days drank the milk in this manner, a gentle laxative medicine, and such as has a tendency to evacuate the fœces, is to be interposed and repeated every sixth day. 5. He ought never to use wine or malliquors for drink, but rather pitifans of barley, hartshorn, and citron-peel. He must also carefully abstain from aliments of hard digestion, and such as generate bad juices. On the contrary, broth prepared of tortoises, cray-fish, veal, fowls, lettuce, and garden succory, are of singular service. 6. In order to augment the

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concoctive force of the stomach, which in a phthisis is very languid, it is expedient between meals to exhibit some balsamic pectoral, and stomachic elixir, such as that made of the best myrrh, saffron, nutmegs, orange-peel, marsh-trefoil, and liquorice root.

As to the pectoral and vulnerary balsams, the forms recommended by the most celebrated physicians, are, according to the same author, the following ones:

Take of the oil of St. John's wort, two ounces; of sperma-ceti, six drachms; of the best Venice-turpentine, three drachms; of dragon's blood, one drachm; and of laudanum opiatum, six grains: mix all together, and let the dose be from one to two drachms.

Nor, says he, have I found the following balsam less efficacious: take of the oil of sweet almonds, two ounces: and of the flowers of sulphur, sublimed by quick-lime, two drachms: boil over a gentle fire; then add of the balsam capivi, one drachm; of sperma ceti and bees-wax, each half an ounce; of the extract of saffron, half a drachm; and of the oils of anise, fennel, and mace, each ten drops.

Another balsam for answering the same end may be prepared thus. Take of the best Prussian honey and mountain-diacodium, each one ounce; of the aqueous essence of myrrh inspissated, half an ounce; of the flowers of sulphur, and the extract of the tops of yarrow, each two drachms; of the extract of saffron, half a drachm; and of the oils of mace and sassafras-wood, each eight drops.

These noble and efficacious balsams, when their use is indicated, cannot be exhibited in a better or more proper vehicle, than a sufficient quantity of the milk of asses, goats, or cows.

In colliquative sweats, Morton recommends the free use of pearl-julep; to which may be added chalk, coral, dragon's blood, or other absorbents: the patient should not be allowed to sleep too long, and the bed-cloths should be lighter.

* **PHYLLIS**, in fabulous history, was the daughter of Lycurgus, king of Thrace. Demophoon, the son of Theseus, on his return from the siege of Troy, was entertained at her father's palace; where they becoming passionately in love with each other, she granted him the last favour, on his promising to return to marry her, after he had settled his affairs in his

own country; but staying beyond the stipulated time, Phyllis became distracted at the thoughts of being slighted, and went to hang herself; when the gods pitying her, changed her into an almond-tree that bore no leaves. But Demophoon returning, and hearing the fate of his mistress, embraced the tree, which instantly shot forth leaves, as an expression of her being still sensible of his fondness.

PHYSIC, the same with medicine.

PHYSICAL, something relating to nature.

PHYSICIAN, a person who professes medicine, or the art of healing diseases.

For an account of the college of physicians in London, see *College*.

PHYSICS, a denomination sometimes given to natural philosophy. See *Natural Philosophy*.

PHYSIOGNOMONICS, among physicians, such signs as being taken from the countenance, serve to indicate the state, disposition, &c. both of the body and mind: and hence the art of reducing these signs to practice is termed physiognomy, than which nothing can be more precarious, as it respects the characters of people, accustomed by education and practice to dissemble their sentiments.

PHYSIOLOGY, a discourse of nature, and natural bodies; or, it is that part of natural philosophy which treats of the various phenomena of nature in a scientific and speculative way; in which sense, neither chemistry nor experimental philosophy are included under it.

PIA MATER, in anatomy, the third tunic or membrane of the brain, placed immediately under the tunica arachnoides, and closely and firmly connected to the brain: it not only extends over the whole surface of the brain, but insinuates itself into all its cavities, and is carried down to the bottom of all its furrows. It covers also the spinal marrow, and all the nerves, and adheres also to the tunica arachnoides very closely and firmly, in the upper part of the head; but much less so below, with the dura mater.

PIZZA, in building, a portico, or covered walk supported by arches.

PICA, in medicine, a depravation of appetite, which makes the patient long for what is unfit for food, or incapable of nourishing, as chalk, ashes, coals, plaster, lime, &c.

PICA, the name of a type used by Printers, of the following size:

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"Modern Dictionary of Arts and Sciences."

PICAGE, or **PICCAGE**, an ancient custom or duty paid at fairs and markets, for breaking the ground, and pitching up stalls or standings.

PICKLE, a brine or liquor, commonly composed of salt, vinegar, &c. sometimes with the addition of spices, wherein meat, fruit, and other things are preserved and seasoned. The same name is also given to any vegetable production prepared in pickle.

PICTURE, a piece of painting, or a subject represented in colours, on wood, canvas, paper, or the like.

PIECE, in commerce, signifies sometimes a whole, and sometimes a part of the whole. In the first sense, we say a piece of cloth or velvet, &c. meaning a certain quantity of yards regulated by custom; being yet entire, and not cut. In the other signification, we say a piece of tapestry, meaning a distinct member wrought a-part, which with several others, make one hanging.

PIECE, in matters of money, signifies sometimes the same thing with species; and sometimes by adding the value of the pieces, it is used to express such as have no other particular name, as an eighteen shilling piece, &c.

PIECE, in heraldry, denotes an ordinary or charge.

PIECES, in the military art, all sorts of great guns and mortars. Battering pieces are the larger sort of guns used at sieges for making the breaches; such are the twenty-four pounders, and culverine, the one carrying twenty-four, and the other an eighteen pound ball. Field-pieces are twelve-pounders, demi-culverines, six-pounders, sakers, minions, and three-pounders, which march with the army, and encamp always behind the second line, but in the day of battle are in the front. A soldier's firelock is likewise called his piece.

*** PIEDMONT**, a principality of Italy, at the foot of the Alps, is bounded on the North by Vallois, on the East by the duchies of Milan and Montferrat, on the South by the territory of Genoa and the county of Nice, and on the West by France and the Alps. It is one of the most fruitful and pleasant provinces in Italy, and is about 175 miles in length, and 40 in breadth. It abounds in corn, wine, fruits, cheese, hemp, flax, and metals, butcher's meat, and game of all

PIG

sorts. The chief religion is the Roman Catholic. Turin is the capital city. The vallies of Piedmont, which lie between France and Italy, are inhabited by the Vaudois, who profess the protestant religion, if it may be so called; for some maintain, that it is clear from history that they have always professed the same religion from the first establishment of christianity in these parts. Towards the end of the last century, the French king prevailed on the duke of Savoy to drive these people out of the country; in consequence of which 20,000 people retired into Germany, Holland, and England. There are still, however, a great many of them left, but they are obliged to have a Roman Catholic church in every parish.

PIEPOWDER COURT, or **PIEPOUDRE**, or **PEDES PULVERISATI**, a court held in fairs for doing justice to buyers and sellers, and redressing disorders there committed. It is so called, as being most usually held in the summer, when the suitors to the court have dusty feet, &c. This is a court of record, incident to every fair, and is to be held only during the time the fair is kept.

PIER, or **PEER**, in building, a mass of stone, &c. opposed by way of fortress against the force of the sea, or a great river, for the security of ships that lie at harbour in any haven.

It is also used in architecture for a kind of pilaster, or buttress, raised for support, strength, and sometimes for ornament.

PIERCED, **PERCE'**, in heraldry, is when any ordinary is perforated, or struck through, shewing, as it were, a hole in it, which must be expressed in blazon, as to its shape: thus if a cross have a square hole or perforation in the center, it is blazoned square-pierced, which is more proper than quarterly-pierced, as Leigh expresses it.

PIG, in zoology, the young of the hog kind.

PIGEON, in ornithology. See *Columba*.

There are two kinds of pigeons, the wild and the tame; the latter differ from the former only in bigness and familiarity: the wild usually perch upon trees, being seldom seen on the ground. Pigeons are of various sorts, such as carriers, powters, runts, turbets, &c. There are two seasons when you may easily procure a sufficient stock of pigeons, viz. May and August: for at these seasons there are a great number of young pigeons, which may then be purchased very reasonably.

PIGEON HOUSE, a house erected full of holes within for the keeping, breeding, &c. of pigeons, otherwise called a dove-cote. Any lord of a manor may build a pigeon-house on his land, but a tenant cannot do it without the lord's licence. When persons shoot at or kill pigeons within a certain distance of the pigeon-house, they are liable to pay a forfeiture.

In order to erect a pigeon-house to advantage, it will be necessary to pitch upon a convenient situation, of which none is more proper than the middle of a spacious court-yard, because pigeons are naturally of a timorous disposition, and the least noise they hear frightens them. With regard to the size of the pigeon-house, it must depend intirely upon the number intended to be kept; and as to its form, the round should be preferred to the square ones; because rats cannot so easily come at them in the former as in the latter. It is also much more commodious; because you may, by means of a ladder turning upon an axis, easily visit all the nests in the house, without the least difficulty; which cannot so easily be done in a square house. In order to hinder rats from climbing up the outside of the pigeon-house, the walls should be covered with tin plates to a certain height, about a foot and a half will be sufficient; but they should project out three or four inches at the top, to prevent their clambering any higher. The pigeon-house should be placed at no great distance from water, that the pigeons may carry it to their young ones; and their carrying it in their bills will warm it, and render it more wholesome in cold weather. The boards that cover the pigeon-house should be well joined together, so that no rain may penetrate through it. And the whole building should be covered with hard plaster, and white-washed within and without, white being the most pleasing colour to pigeons. There must be no window, or other opening, in the pigeon-house to the eastward: these should always face the south, for pigeons are very fond of the sun, especially in winter. The nests or covers in a pigeon-house, should consist of square holes made in the walls, of a size sufficient to admit the cock and hen to stand in them. The first range of these nests should not be less than four feet from the ground, that the wall underneath being smooth, the rats may not be able to reach them. These nests should be placed in quincunx order, and not directly over one another. Nor must they

be continued any higher than within three feet of the top of the wall: and the upper row should be covered with a board projecting a considerable distance from the wall, for fear the rats should find means to climb the outside of the house.

PIKE, an offensive weapon, consisting of a shaft of wood twelve or fourteen feet long, headed with a flat-pointed steel, called the spear. The pike was a long time in use among the infantry, but now the bayonet, which fixes on at the end of the carbine, is substituted in its place: yet the pike still continues the weapon of foot-officers, who fight pike in hand, salute with the pike, &c.

PIKE, in ichthyology, the same with lucius.

PILASTER, in architecture, a square column, sometimes insulated, but more frequently let within a wall, and only shewing a fourth or fifth part of its thickness. The pilaster is different in different orders; it borrows the name of each, and has the same proportions, and the same capitals, members, and ornaments, with the columns themselves. Pilasters are, however, usually made without either swelling or diminution, and as broad at top as at the bottom; though some of the modern architects, as M. Mansard, &c. diminish them at the top, and even make them swell in the middle, like columns, particularly when placed behind columns. Mr. Perrault observes, that pilasters, like columns, become of different kinds, according to the different manner in which they are applied to the wall. Some are wholly detached, and these Vitruvius calls parastatæ; others have three faces clear out of the wall; others two; and others only one; these Vitruvius calls antæ. Insulate pilasters are but rarely found in the antique; or the chief use the ancients made of them, was to give the greater strength to the extremities of porticoes.

There are four things to be principally regarded in pilasters; their projecture out of the wall; their diminution; the disposition of the entablature, when it happens to be common to them and to a column; and their flutings and capitals. 1. Then the projecture of pilasters that have only one face out of the wall, ought to be one-eighth of their breadth, or at most one-sixth; but when they receive imposts against their sides, the projecture may be a quarter of their diameter. 2. Pilasters are seldom diminished when they have only one face out of the wall: indeed

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decided when they stand in the same line with columns, and the entablature is continued over both, without any break, the pilasters are to have the same dimensions with the columns. 3. Pilasters are sometimes fluted, though the columns that accompany them are not so; and on the contrary, the columns are sometimes fluted, when the pilasters that accompany them are not. The flutings of pilasters are always odd in number, except in half pilasters, which meet at inward angles, where four flutings are made for three, &c.

4. The proportions of the capitals of pilasters, are the same as to height with those of columns; but they differ in breadth, the leaves of pilasters being much broader; because pilasters, though of equal extent, have only the same number of leaves for their girt, viz. eight. Their usual disposition is to have two in each face in the lower row, one in the middle, and two halves in the angles, in the turns of which they meet. Add to this, that the rim of the vase, or tambour, is not straight, as the lower part of it; but a little circular and prominent in the middle. See *Flutings*.

In pilasters that support arches, the proportions, according to Palladio, should be regulated by the light they are placed in; and at the angles by the weight they are to sustain: they must not be too tall and slender, lest they resemble pillars, nor too dwarfish and gross, lest they appear like the piers of bridges. In private buildings they ought not to be narrower than one third, nor broader than two thirds of the vacuity, or interspace between pilaster and pilaster; but as for those that stand at the corners, they may have a little more latitude allowed them, to give the greater strength to the angles. Palladio observes, that in the theatres and amphitheatres, and such massive works, they have been as broad as the half, and sometimes as the whole vacuity or interspace. He also asserts, that their true proportion should be an exact square; but for lessening of expence, they are usually made narrower in flank than in front.

PILCHARD, *Pilchardus*, in ichthyology, a species of clupea, with the upper jaw bispid, and spotted on each side with black.

PILE, in antiquity, a pyramid built of wood, on which the bodies of the deceased were laid in order to be burnt.

PILE, in building, a large stake ram-

med into the ground in the bottom of rivers, or in marshy land, for a foundation to build on.

PILE is used among architects for a mass of building.

PILE, in heraldry, an ordinary in form of a wedge, contracting from the chief, and terminating in a point towards the bottom of the shield.

PILES, in medicine. See *Hæmorrhoides*.

PILGRIMAGE, a kind of religious discipline, which consists in taking a journey to some holy place, to adore the relics of some deceased saint. Pilgrimages began to be made about the middle ages of the church; but they were most in vogue after the end of the eleventh century, when every one was for visiting places of devotion, not excepting kings and princes themselves; and even bishops made no difficulty of being absent from their churches on the same account. The places most visited were Jerusalem, Rome, Compostella, and Tours; but the greatest numbers now resort to Loreto, to visit the chamber of the blessed Virgin, in which she was born, and brought up her son Jesus, till he was twelve years of age. This chamber, it is pretended, was carried by angels into Dalmatia, about the year 1291, and afterwards in the same manner transported to Loreto, where a magnificent cathedral is built over it. In this chamber is the image of the blessed Virgin, almost covered with pearls and diamonds, and round the statue is a kind of rainbow formed of precious stones of various colours. Five hundred thousand pilgrims sometimes resort to this house in one year, to pay their devotions before this glorious image.

* **PILKINGTON**, *Latitia*, a lady distinguished by her poetical talents, was the daughter of Dr. Van Lewen, an eminent physician of Dutch extraction, who settled in Dublin; in which city she was born in the year 1722. She had early a strong inclination to letters, and when she grew up had so surprising a memory, that she could repeat by heart almost all the poems of our most celebrated modern poets. She was married young to the Reverend Mr. Matthew Pilkington, a gentleman known in the poetical world by his volume of *Miscellanies*, revised by Dean Swift; but his jealousy occasioned continual discontents. Mr. Pilkington came to London to serve as chaplain to the lord mayor; while he continued there,

He wrote her a very affectionate letter, in which he praised her poetry, and informed her that Mr. Pope, to whom he had shewn her verses, longed to see the author, and that he himself heartily wished her in London; upon which she accepted the invitation, and returned with her husband to Ireland; but soon after, Mr. Pilkington entertaining fresh suspicions of her fidelity, they separated. She afterwards returned to England, and settled in London, where becoming known to Colley Cibber, she, by this means lived on the contributions of the great; but these resources failing, she was arrested for debt, and confined in the Marshalsea prison; where, after lying nine months, she was released by Mr. Cibber, who solicited charities for her. She afterwards took a little shop in St. James's-street, where she sold pamphlets and prints, where by the liberality of the great, and their generously subscribing to her memoirs, she lived for some time above want. At length she returned to Dublin, where she printed the first volume of her Memoirs in octavo, through which are scattered many beautiful pieces of poetry. On this occasion, she received many handsome presents from the persons of distinction who bought her book; and as she had been very severe in drawing characters of those who had not shewn themselves her friends, many others now endeavoured to disarm her satire and conciliate her esteem, that they might not be mentioned in an unfavourable light in her second and third volumes, which were afterwards published. After living, without the least oeconomy, in a continual succession of want and plenty, she died at Dublin, August 29th 1750, in the 39th year of her age.

PILL, in pharmacy, a form of medicine resembling a little ball, to be swallowed whole, invented in favour of such as cannot take ill-tasted medicinal draughts, as also to keep in readiness for occasional use without deviating.

PILLAR, in architecture, a kind of irregular column, round and insulated, but deviating from the proportions of our column.

Pillars are always either too massive, or too slender for regular architecture; such are the pillars which support Gothic vaults, or buildings; and, indeed, they are not restrained by any rules, their parts and proportions being arbitrary.

Square PILLAR, a massive work,

called also a pier, or piedroit, serving to support arches, &c.

PILLORY, anciently a post erected in a cross-road, by the lord of the manor, with his arms upon it, as a mark of his seignory, and sometimes with a collar to fix criminals to. At present, it is a wooden machine, to confine the head and hands, in order to expose criminals to public view, and to render them publicly infamous.

PILOT, one employed to conduct ships over bars and sands, or through intricate channels, into a road or harbour.

PIMENTA, or PIMENTO, in the materia medica, Jamaica-pepper, or allspice, the dried aromatic berry of a large tree growing in the mountainous parts of Jamaica, reckoned a species of myrtle, and called by Sir Hans Slone, *myrtus arborea aromatica foliis laurinis*; by Linnæus, *myrtus foliis alternis*.

Pimenta is a moderately warm spice, of an agreeable flavour, somewhat resembling that of a mixture of cloves, cinnamon, and nutmegs. Distilled with water it yields an elegant essential oil, somewhat ponderous as to sink in the aqueous fluid, its taste moderately pungent, in smell and flavour approaching to oil of cloves, or rather a mixture of those of cloves and nutmegs: the remaining decoction inspissated, leaves an extract somewhat ungrateful, but not pungent, and the berry itself is found to be almost wholly deprived of its taste as well as flavour; the warmth of this spice residing rather in the volatile than in the fixed parts.

This spice, at first brought over for dietetic uses, has been long employed in the shops as a succedaneum to the more costly oriental aromatics; from them it was introduced into our hospitals, and is now received both in the London and Edinburgh Pharmacopœias. The college of London directs a simple water to be distilled from it, in the proportion of a gallon from half a pound: this is strongly impregnated with the flavour of the pimenta, though it is less elegant than the spirituous water which the shops have been accustomed to prepare, by drawing off two or three gallons of proof spirit from the same quantity of the spice. The essential oil does not seem to be much known in practice; though it promises to be a very useful one, and might, doubtless, on many occasions, supply the place of many of the dearer oils. The quantity of oil afforded by the spice is

very

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very considerable; Cartheuser indeed says, that only about half a dram is to be got from sixteen ounces; a mistake, which probably has arisen from inadvertance in copying Neumann's proportion, of half a dram from an ounce, or one sixteenth: so large a proportion as this last cannot, however, be collected in its proper form, the oil that remains dissolved in the distilled water being here included.

PIMPLE, in surgery, a small pustule, arising chiefly on the face.

PIN, in commerce, a small necessary implement made of brass wire, used chiefly by the women in adjusting their dress. The perfection of pins consists in the stiffness of the wire and its whiteness, in the heads being well turned, and in the fineness of the points. The London pointing and whitening are in most repute, because the London pin-makers, in pointing, use two steel mills, the first of which forms the point, and the latter takes off all irregularities, and renders it smooth, and as it were polished; and in whitening, they use black tin granulated: whereas in other countries they are said to use a mixture of tin, lead, and quicksilver; which not only whitens worse than the former, but is also dangerous, on account of the ill quality of that mixture, which renders a puncture with a pin thus whitened, somewhat difficult to be cured. The consumption of pins is incredible, and there is no commodity sold cheaper. The number of hands employed in this manufacture is very great, each pin passing through the hands of six different workmen, between the drawing of the brass wire, and the sticking of the pin in the paper.

Pins are sometimes made of iron-wire, rendered black by a varnish of linseed-oil, with lamp-black, which the brass-wire would not receive: these are designed for the use of persons in mourning, though not universally approved of.

PINCHING, in gardening, a kind of pruning, performed by nipping off the young and tender springs of trees and plants between the nails of the thumb and finger, chiefly practised in April or May, and sometimes in June and July, on the large useless branches towards the top of a plant or tree, because they consume a great deal of the sap. See *Pruning*.

* **PINDAR**, a celebrated Greek poet, and the prince of the Lyric poets, was born at Thebes, in Boeotia, about 500 years before the Christian era. He was

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at the highest point of his reputation, when Xerxes invaded Greece, and it is believed that he died about the 436th year before the Christian era. He was the author of a great number of poems of several kinds, but there have been none of them handed down to us except the odes he wrote upon those who in his time had gained the prize at the four solemn Grecian games. There appears in Pindar's odes a grandeur, elevation, and strength that is inexpressible. The rapidity of his diction is, in the opinion of Horace, like that of an impetuous torrent, which descends from the mountains, and carries all before it. Alexander had such a veneration for the memory of this great poet, that at the destruction of Thebes, he, on his account, preserved his house and family.

PINDARIC, in poetry, an ode in imitation of the manner of Pindar. The Pindaric manner is distinguished by the boldness and height of the flights, the suddenness and surprisingness of the transitions, and the seeming irregularity, wildness, and enthusiasm of the whole. The only part remaining of Pindar's works is a book of odes, all in praise of the victors at the Olympian, Pythian, Nemean, and Isthmian games; whence the first is intitled the Olympians, the second the Pythians, the third the Nemeans, and the fourth the Isthmians.

PINE, *Pinus*, in botany, a genus of trees, the male flowers of which are collected in a scaly conical bunch, having many stamens, which are connected at their base, terminated by erect summits, included in the scales, which supply the want of petals and empalement. The female flowers are collected in a common oval cone, and stand at a distance from the male on the same tree. Under each scale of the cone is produced two flowers, which have no petals, but a small germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterwards becomes an oblong oval nut, crowned with a wing, included in the rigid scale of the cone.

There are various species of the pine-tree; but two only that deserve cultivating; namely, the Scotch pine, and the white pine, commonly called in England lord Weymouth's, or New-England pine.

The Scotch pine, says Mr. Miller, so called from its growing naturally on the mountains of Scotland, is the tree that affords the red or yellow deal, which is the

the most durable of any of the kinds yet known. The leaves of this tree are pretty broad and short, of a greyish colour, growing two out of each sheath; the cones are small, pyramidal, and end in narrow points; they are of a light colour, and the seeds are small.

This sort grows well almost upon every soil; I have planted numbers of the trees upon peat-bogs, where they have made great progress. I have also planted them in clay, where they have succeeded far beyond expectation; and upon sand, gravel, and chalk, they likewise thrive as well; but as they do not grow near so fast upon gravel and sand as upon moist ground, so the wood is much preferable; for those trees which have been cut down upon moist soils, where they have made the greatest progress, when they have been sawn out into boards, have not been valuable, the wood has been white, and of a loose texture; whereas those which have grown upon dry gravelly ground have proved nearly equal to the best foreign deals: and I doubt not but those plantations, which of late years have been made of these trees, will, in the next age, not only turn greatly to the advantage of their possessors, but also become a national benefit.

The white pine is one of the tallest trees of all the species, often growing a hundred feet high, as I have been credibly informed. The bark of this tree is very smooth and delicate, especially when young; the leaves are long, and slender, five growing out of each sheath; the branches are pretty closely garnished with them, so make a fine appearance; the cones are long, slender, and very loose, opening with the first warmth of the spring; so that if they are not gathered in winter, the scales open and let out the seeds. The wood of this sort is esteemed for making of masts for ships; it is in England called lord Weymouth's or New-England pine, as hath been already observed. As the wood of this tree was generally thought of great service to the navy, there was a law made in the ninth year of queen Anne, for the preservation of the trees, and to encourage their growth in America; and it is within forty years past these trees began to be propagated in England in any plenty, though there were some large trees of this sort growing in two or three places long before, particularly at lord Weymouth's at Longleat, Sir Wyndham Knatchbull's in Kent; and it has been chiefly from

the seeds of the latter that the much greater number of these trees now in England have been raised: for although there has annually been some of the seeds brought from America, yet those have been few in comparison to the produce of the trees in Kent; many of the trees which have been raised from the seeds of those trees now produce plenty of good seeds, particularly those in the gardens of the late duke of Argyll at Whitton, which annually produce large quantities of cones, which his grace, when living, most generously distributed to all the curious.

All the sorts of pines are propagated by seeds, which are produced in hard woody cones; the way to get the seeds out of these cones, which are close, is to lay them before a gentle fire, which will cause the cells to open, and then the seeds may be easily taken out. If the cones are kept entire, the seeds will remain good some years, so that the surest way to preserve them is to let them remain in the cones until the time for sowing the seeds. If the cones are kept in a warm place in summer, they will open, and emit the seeds, but if they are not exposed to much heat, many of the sorts will remain entire some years; especially those which are close and compact; and the seeds, which have been taken out of cones of seven years old, have grown very well, so that these may be transported to any distance, provided the cones are well ripened, and properly put up.

The best time for sowing the seeds of pines is about the end of March: when the seeds are sown, the place should be covered with nets to keep off birds, otherwise, when the plants begin to appear with the husk of the seed on their tops, the birds will pick off the heads of the plants, and destroy them.

Wherever large plantations are designed to be made, the best method will be to raise the plants either upon a part of the same land, or as near to the place as possible, and also upon the same sort of soil; a small piece of ground will be sufficient to raise plants enough for many acres; but, as the plants require some care in their first raising, if the neighbouring cottagers, who have many of them small inclosures adjoining to their cottages; or, where this is wanting, a small inclosure should be made them for the purpose of raising the plants; and they be furnished with the seeds and directions for sowing them, and managing the

the young plants, till they are fit for transplanting, the women and children may be usefully employed in this work, and the proprietors of land agreeing with them to take their plants, when raised, at a certain price, it would be a great benefit to the poor, and hereby they would be engaged to have a regard for the plantations when made; and prevent their being destroyed.

The Scotch pine, as was before observed, being the hardiest of all the kinds, and the wood of it the most useful, is the sort which best deserves care. This will thrive upon the most barren sands, where scarce any thing else, except heath and furze, will grow; so that there are many thousand acres of such land lying convenient for water carriage, which at present is of little benefit to any body, that might, by plantations of these trees, become good estates to their proprietors, and also a national benefit; and as the legislators have taken this into their consideration, and already passed some laws for the encouraging these plantations, as also for their preservation and security; so it may be hoped that this will be undertaken by the gentlemen who are possessed of such lands in all the different parts of the kingdom, with proper spirit; for although they may not expect to receive much profit from these plantations in their own time, yet their successors may with large interest, and the pleasure which these growing trees will afford them, by beautifying the present dreary parts of the country, will in some measure recompense them for their trouble and expence, and by creating employment for the poor, lessen those rates which are now, in many parts of England, scarce to be borne.

The expence of making these plantations is what most people are afraid of, so would not engage in it; but the greatest of the expence is that of fencing them from the cattle, &c. for the other is trifling, as there will be no necessity for preparing the ground to receive the plants, and the charge of planting an acre of land with these plants, will not be more than thirty shillings where labour is dear, exclusive of the plants, which may be valued at forty shillings more. I have planted many acres of land with these trees, which was covered with heath and furze, and have only dug holes between to put in the plants, and afterward laid the heath or furze, which was cut, upon the surface of the ground

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about their roots, to prevent the ground drying, and few of the plants have failed. These plants were most of them four years old from seed, nor was there any care taken to clean the ground afterward, but the whole left to shift, and in five or six years the pines have grown so well, as to over-power the heath and furze, and destroy it.

The distance which I have generally planted these plants in all large open situations, was about four feet, but always irregular, avoiding planting in rows as much as possible; and in the planting, the great care is not to take up the plants faster than they can be planted, so that some men have been employed in digging up the plants, while others were planting. Those who take up the plants, must be looked after to see they do not tear off their roots; or wound their bark; and as fast as they are taken up, the roots should be covered to prevent their drying, and put into their new quarters as soon as possible. In planting them, care should be had to make the holes large enough for their roots, as also to loosen and break the clods of earth, and put the finest immediately about their roots, then to settle the earth gently with the foot to the roots of the plant. If these things are duly observed, and a proper season chosen for performing it, there will be very little hazard of their succeeding; but I have seen some plantations made with plants, which were brought from a great distance, and had been so closely packed up, as to cause a heat, whereby most of the plants within had their leaves changed yellow, and few of them have grown, which has discouraged others from planting, not knowing the true cause of their failure.

After the plantations are made, the only care they require for five or six years, will be to secure the plants from cattle, hares, and rabbits; for if these are admitted to them, they will make great destruction in a short time, for if the branches are gnawed by hares or rabbits, it will greatly retard the growth of the plants, if not destroy them.

In about five or six years after planting, the branches of the young trees will have met, and begin to interfere with each other, therefore they will require a little pruning; but this must be done with great caution. The lower tier of branches only should be cut off; this should be performed in September, at

which time there will be no danger of the wounds bleeding too much, and the turpentine will harden over the wounds as the season grows cold, so will prevent the wet from penetrating them. These branches should be cut off close to the stem of the plants, and care should be taken in the doing of this, not to break any of the remaining branches of the young trees. This work should be repeated every other year, at each time taking off only the lower tier of branches; for if the plants are much trimmed, it will greatly retard their growth, as it does in general that of all trees; but as these trees never put out any new shoots where they are pruned, so they suffer more from amputation than those which do.

In about twelve or fourteen years these will require no more pruning, for their upper branches will kill those below where they have not air; but soon after this, if the plants have made good progress, it may be necessary to thin them; but this should be gradually performed, beginning in the middle of the plantation first, leaving the outside close to screen those within from the cold, so by degrees coming to them at last, whereby those, which were first thinned, will have had time to get strength, so will not be in danger of suffering from the admission of cold air. When these plantations are thinned, the trees should not be dug up; but their stems cut off close to the ground, for the roots never shoot again, but decay in the earth, so there can no harm arise by leaving them, and hereby the roots of the remaining plants are not injured. The trees which are now cut, will be fit for many purposes; those which are straight, will make good putlocks for the bricklayers, and serve for scaffolding poles, so that there may be as much made by the sale of these, as will defray the whole expence of the planting, and probably interest for the money into the bargain.

As the upright growth of these trees renders their wood the more valuable, they should be left pretty close together, whereby they will draw each other up, and grow very tall. I have seen some of these trees growing, whose naked stems have been more than seventy feet high, and as straight as a walking cane, and from one of these trees there were as many boards sawed, as laid the floor of a room near twenty feet square. If these trees are left eight feet asunder each way,

it will be sufficient room for their growth; therefore, if at the first thinning a fourth part of the trees are taken away, the other may stand twelve or fourteen years longer, by which time they will be of a size for making ladders, and standards for scaffolding, and many other purposes: so that from this sale, as much may be made, as to not only pay the remaining part of the expence of planting, if any should be wanting in the first, but rent for the land with interest, and the standing trees for fortunes of younger children. This may be demonstrated by figures, and there has been several examples of late years, where the profits have greatly exceeded what is here mentioned. *Miller's Garden. Diet.*

Pitch, tar, resin, and turpentine, are all made from these trees by a very familiar process. In the spring time, when the sap is most free in running, they pare off the bark of the pine-tree, to make the sap run down into a hole which they cut at the bottom to receive it: in the way, as it runs down, it leaves a white matter like cream, but a little thicker; this is very different from all the kinds of resin and turpentine in use, and it is generally sold to be used in the making of flambeaux, instead of white bees wax. The matter that is received in the hole at the bottom, is taken up with ladles, and put in a large basket; a great part of this immediately runs through, and this is the common turpentine. This is received into stone, or earthen pots, and is ready for sale. The thicker matter, which remains in the basket, they put into a common alembic, adding a large quantity of water; they distil this as long as any oil is seen swimming upon the water; this oil they separate from the surface in large quantities, and this is the common oil or spirit of turpentine: the remaining matter, at the bottom of the still, is common yellow resin. When they have thus obtained all that they can from the sap of the tree, they cut it down, and, hewing the wood into billets, they fill a pit dug in the earth with these billets, and, setting them on fire, there runs from them while they are burning, a black thick matter; this naturally falls to the bottom of the pit, and this is the tar. The top of the pit is covered with tiles, to keep in the heat; and there is at the bottom a little hole, out at which the tar runs like oil: if this hole be made too large, it sets the whole quantity,

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tity of the tar on fire; but, if small enough, it runs quietly out.

The tar, being thus made, is put up in barrels, and, if it be to be made into pitch, they put it into large boiling vessels, without adding any thing to it: it is then suffered to boil a while, and, being then let out, is found, when cold, to be what we call pitch. *Phil. Trans.* N^o 243.

PINE-APPLE, the same with ananas. See *Ananas*.

PINEAL GLAND, in anatomy, a gland in the third ventricle of the brain, thus called from its resemblance to a pine-apple. It is of a greyish colour, and its process and base are often medullary: this gland has often by many been supposed the peculiar seat of the soul.

PINION, in mechanics, an arbor, or spindle, in the body of which are several notches, which catch the teeth of a wheel that serves to turn it round; or it is a lesser wheel which plays in the teeth of a larger.

PINK, *Caryophyllus*, in botany, the English name of several species of the dianthus. See *Dianthus*.

PINNACE, among seamen, a small vessel with two masts, used in the coasting trade, particularly in Newfoundland, and other parts of North-America: also the name of a particular kind of boat commonly rowed with eight oars.

PINNATED LEAVES, *pinnata folia*, in botany, leaves formed in manner of a wing, and composed of two large ranges, or series of foliola, annexed to the two sides of one common, oblong petal.

PINNING, in building, the fastening of tiles together, with pins of heart of oak, for the covering of an house, &c.

PINT, a vessel, or measure used in estimating the quantity of liquids, and even sometimes of dry things.

PIONEER, in the art of war, a labourer employed in an army to smooth the roads, pass the artillery along, and dig lines and trenches, mines, and other works.

PIP, or *PEP*, *Pepia*, a disease among poultry, consisting of a white thin skin, or film, that grows under the tip of the tongue, and hinders their feeding. It usually arises from want of water, or from the drinking puddle-water, or eating filthy meat. It is cured by pulling off the film with the fingers, and rubbing the tongue with salt. Hawks are parti-

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cularly liable to this disease, especially from feeding on stinking flesh.

PIPE, in building, &c. a canal, or conduit, for the conveyance of water and other liquids. Pipes for water, water-engines, &c. are usually of lead, iron, earth, or wood: the latter are usually made of elm or elder. Those of iron are cast in forges; their usual length is about two feet and a half; several of these are commonly fastened together by means of four screws at each end, with leather or old hat between them, to stop the water. Those of earth are made by the potters; these are fitted into one another, one end being always made wider than the other. To join them the closer, and prevent their breaking, they are covered with tow and pitch: their length is usually about that of the iron-pipes. The wooden pipes are trees bored with large iron augres, of different sizes, beginning with a less, and then proceeding with a larger successively; the first being pointed, the rest being formed like spoons, increasing in diameter, from one to six inches or more: they are fitted into the extremities of each other.

Lead pipes are of two sorts, the one soldered, the other not.

Tobacco-PIPE, a machine used in the smoking of tobacco, consisting of a long tube, made of earth or clay, having at one end a little case, or furnace, called the bowl, for the reception of the tobacco, the fumes whereof are drawn by the mouth through the other end. Tobacco-pipes are made of various fashions; long, short, plain, worked, white, varnished, unvarnished, and of various colours, &c. The Turks use pipes three or four feet long, made of rushes, or of wood bored, at the end whereof they fix a kind of a pot of baked earth, which serves as a bowl, and which they take off after smoking.

PIPE, a vessel measure for wine, and things measured by wine-measure.

PIRATE, **PYRATE**, or **ROVER**, *Pirata*, a person, or vessel that robs on the high seas, without permission or authority of any prince or state. When a pirate enters into any port or haven, and there robs a merchant's ship, this is not piracy, because it is not done on the high sea; but it is a robbery at the common law. In case a ship is riding at anchor on the sea, and it happens that the mariners or seamen are part in their boat, and the rest on shore, by which accident

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none are left in the ship; here, if a pirate shall attack her, and commit a robbery, it is piracy. Nevertheless, the taking, by a ship at sea, in great necessity of victuals, cables, ropes, &c. such things out of another vessel, is not so, where that other vessel can spare such things, and the takers pay or give security for them. The manner of trying a pirate is by a special commission, directed to the lord high admiral, &c. and the offence of piracy may be heard and determined, as if the robbery was committed on land; and offenders shall suffer the like pains of death, loss of lands and goods, &c. Persons combining to yield up ships to pirates, or to lay violent hands on the commanders of ships, or that correspond with any pirate, are adjudged guilty of piracy.

• **PISA**, an ancient, large, handsome, and strong city of Italy, in Tuscany, and capital of the Pisano, with an university, an archbishop's see, and three forts. The territory, though very small, is enriched with several fine productions; there is curious marble, good alabaster, lapis lazuli, ultramarine, vitriol, and salt-works. The town is seated on the Arno, at a small distance from the sea, in a very fertile plain. That river runs through Pisa, and there are three bridges thereon, that in the middle being constructed with marble; on this bridge the inhabitants every year have a mock-fight, like that of Venice. The town is so thin of inhabitants, that grass grows in the principal streets. The cathedral is a magnificent structure, and on the right side of the choir is the leaning tower, so much talked of. In the great square, before St. Stephen's church, is a white marble statue, representing duke Cosmo the Great. The grand duke's palace, and the magnificent exchange, are worth taking notice of. It is 10 miles N. of Leghorn, and 10 S. W. of Lucca. Long 10. 24 E. Lat. 43. 41. N.

PISCES, in astronomy, the twelfth sign or constellation of the zodiac. The stars in Pisces, in Ptolemy's catalogue, are 38; in Tycho's 33; and in the Britannic catalogue, 109.

PISCIS VOLANS, in astronomy, a small constellation of the southern hemisphere, unknown to the ancients, and invisible to us in these northern regions.

PISSASPHALTUM, earth-pitch, in natural history, a fluid, opaque, mineral body, of a thick consistence, of a strong smell, readily inflammable, but leaving

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a residuum of greyish ashes, after burning. It arises out of the cracks of rocks, in several places in the island of Sumatra, and in some other parts of the East-Indies, and is much esteemed there, in paralytic disorders. It is greatly recommended by the ancients as an emollient, maturant, and digestive, and was used in cataplasms for ripening all sorts of tumours, and against the sciatica, and other pains of the limbs.

PISELÆUM INDICUM, Barbadoes tar, in natural history, a mineral fluid, of the nature of the thick bitumens, and of all others the most approaching, in appearance, colour, and consistence, to the true pissasphaltum, though differing from it in other respects. It is very frequent in many parts of America, where it is found trickling down the sides of mountains in large quantities, and sometimes floating on the surface of the waters: but it seems to be almost lost at this time in the island of Barbadoes, from whence it was originally named. It has been greatly recommended internally in coughs and other disorders of the breast and lungs; but it is seldom to be met with genuine.

PISTACHIA, in botany, a genus of plants, whose fruit is an oblong, pointed nut, about the size of a filbert: including a kernel of a pale greenish colour, covered with a reddish skin. It is the produce of a large tree, with winged leaves resembling those of the ash, which grows spontaneously in the Eastern countries, and bears the cold of our own. Pistachia nuts have a pleasant sweetish unctuous taste, resembling that of sweet almonds; their principal difference from which consists in their having rather a greater degree of sweetness, accompanied with a light grateful flavour: and in being more oily, and hence somewhat more emollient, and perhaps more nutritious. They have been ranked among the principal analeptics, and greatly esteemed by some in certain weaknesses and emaciations. They are taken chiefly in substance, their greenish hue rendering them unsightly, in the form of an emulsion. They are very liable to grow rancid in keeping.

PISTIL, among botanists, the female organ of generation in plants: it consists of three parts, the germen, style, and stigma: the germen supplies the place of an uterus in plants, and is of various shapes, but always situated at the bottom of the pistil, and contains the embryoseeds;

P I S

seeds : the style is a part of various forms also, but, always placed on the germen : and the stigma is also of various figures, but always placed on the top of the style, or, if that be wanting, on the top of the germen.

PISTOL, the smallest piece of fire-arms, borne at the saddle-bow, on the girdle, and in the pocket.

PISTOLE, a gold coin struck in Spain, and in several parts of Italy, Switzerland, &c.

PISTON, *Embellus*, in pump-work, a short cylinder of metal, or other solid substance, fitted exactly to the cavity of the barrel or body of the pump. See *Pump*.

PISUM, pea, in botany, a genus of plants, producing papilionaceous flowers ; the vexillum is broad, heart-shaped, reflexed, emarginated, and ending in a point ; the alæ are roundish, connivent, and shorter than the vexillum ; the carina is compressed, semilunulated, and shorter than the alæ ; the fruit is a large, long, unilocular, and bivalve pod, containing several globose seeds. The stalks of the pea plant are long, hollow, and of a sea-green colour ; the leaves are oblong, and of the same colour ; and some are so placed that the stalks seem to run through them, while others grow by pairs on the ribs, that are terminated by tendrils, which lay hold of every thing they meet with. The common white pea succeeds best in a light land, somewhat rich ; the time of sowing them is in the middle of April. Three bushels are the common allowance for an acre ; and they kill the weeds the land is subject to, better than any other crop. In Staffordshire they sow the garden rouncivals in fields, and they grow and yield very well, though they are left trailing upon the ground without any support of sticks. The white and rouncival pease are only to be sown with a broad cast, and harrowed in ; but the common grey pea, which is more frequently sown in fields than either of them, must be sown under furrow, and delights most in a cold wet clay. These are to be sown in February ; and the common quantity of seed is two bushels to an acre. The blue pea is the best kind for light sandy land, and is to be early sown ; all pease love land manured with lime or with marle. In Suffolk they plow up their lays in the beginning of March, and, turning the turf well, they have a cross stick set with iron pegs, which they strike down with their feet :

P L A

these pegs make holes at equal distances ; into which they have boys and girls following to drop the pease singly, till all the land is set. As soon as this crop is cut, they plow the land across, and harrowing it well, they plow it again, and sow it about Michaelmas with wheat, and the next year with barley, then with oats ; after which the land requires new improvement. *Mortimer's Husbandry*.

PITCH, a tenacious oily substance, drawn chiefly from pines and firs, and used in shipping, medicine, and various other arts : or it is more properly tar, inspissated by boiling it over a slow fire.

PITCHING, in naval affairs, the act of plunging or falling headlong into a sea, when the wave, by which the ship's fore-part is lifted up, is suddenly withdrawn from under the prow. Pitching is often extremely dangerous to a vessel, as it strains both the hull and the masts to a great degree, and frequently carries away the latter by a violent jerk.

PITH, in vegetation, the soft spongy substance in the central parts of plants and trees. As the substance of the trunk in trees, says Boerhaave, become more woody, the pith is compressed, and straitened to such a degree, that it wholly disappears. It is plain from this, that the office of the pith, in vegetation, cannot be very great, since it is not of perpetual duration. By its spongy structure, it seems fitted to receive any superfluous moisture that might transude through the pores of the woody fibres. If by such moisture, or from any other cause, it happens to rot and perish, as frequently happens in elms, the tree is found to grow full as well without it ; a proof it is of no essential use in vegetation.

PITUITARY GLAND, in anatomy, a gland in the brain, of the size of a very large pea.

PIVAT, or **PIVOT**, a foot or shoe of iron, or other metal, usually conical, or terminating in a point, whereby a body, intended to turn round, bears on another fixed at rest, and performs its circumvolutions. The pivot usually bears or turns round in a sole, or piece of iron or brass, hollowed to receive it.

PLACARD, or **PLACART**, among foreigners, signifies a leaf or sheet of paper, stretched out and applied on a wall or post, containing edicts, regulations, &c.

PLACE, *Locus*, in philosophy, a mode of space, or that part of immovable

veable space which any body possesses. See *Space*.

Place is to space or expansion, says Mr. Locke, as time is to duration. Our idea of place is nothing but the relative position of any thing with reference to its distance from some fixed and certain points. Whence we say, that a thing has or has not changed place, when its distance either is or is not altered with respect to those bodies with which we have occasion to compare it. That this is so, continues that great philosopher, we may easily gather from hence, that we have no idea of the place of the universe, though we can of all its parts. To say that the world is somewhere, means no more than it does exist: however, the word place is sometimes taken to signify that space which any body takes up; and in this sense, according to the same author, the universe may be conceived in a place; but he thinks that this portion of infinite space possessed by the material world, might more properly be called extension.

The place of the sun, star, &c. denotes the sign and degree of the zodiac which the luminary is in; or the degree of the ecliptic, reckoning from the beginning of Aries, which the planet or star's circle of longitude cuts; and therefore coincides with the longitude of the sun, planet, or star. As the sine of the sun's greatest declination $23^{\circ} 30'$: to the sine of any present declination given or observed, for instance, $23^{\circ} 15'$: so is the radius 10: to the sine of his longitude $81^{\circ} 52'$; which, if the declination were north, would give $20^{\circ} 52'$ of Gemini; if south, $20^{\circ} 52'$ of Capricorn for the sun's place. See *Declination*, &c.

The place of the moon being that part of her orbit wherein she is found at any time, is of various kinds, on account of the great inequalities of the lunar motions, which render a number of equations and reductions necessary before the just point be found. The moon's fictitious place is her place once equated; her place nearly true, is her place twice equated; and her true place is her place thrice equated. See *Moon*.

PLACENTA, in anatomy, a soft roundish mass found in the womb of pregnant women; which, from its resemblance to the liver, was called by the ancients *hepar uterinum*, the uterine liver. The number of placentæ in human subjects, answers to that of the fœtuses; and as these are usually single, the placenta is

usually so too; but when there are two or more fœtuses, there are always as many placentæ; yet in this case they often cohere together so as to seem but one, but even in this case, their vessels do not communicate from one to the other.

The use of the placenta is, together with the chorion, to absorb the nutritious juices from the mother's uterus, as the intestines do the chyle; and finally to transmit it to the fœtus, by means of the umbilical veins. And it probably serves to refund again to the parent, the blood and urine of the fœtus, by the umbilical arteries.

PLAFOND, or PIAFOUND, in architecture, the ceiling of a room, whether it be flat or arched, lined with plaster or joiner's work, and frequently enriched with painting.

PLAGIARY, in philology, the purloining another person's works, and putting them off for a man's own.

PLAGUE, a most acute fever, arising from a poisonous miasma, brought from Oriental countries, which unless it is immediately expelled out of the body, by the strength of the vital motions, by buboes and carbuncles, proves fatal. In this, at well as in most contagious diseases, says Hoffman, the venomous miasma is swallowed with the air, and insinuates itself into the salival juices; whence it assails the head, brain, nerves, and animal spirits; producing a torpor in the head, a heaviness, a sleepiness, a violent pain, a stupor of the senses, a forgetfulness, inquietude, watching, and loss of strength. From the fauces it proceeds to the stomach, creating a loathing of food, nausea, anxiety of the precordia, cardialgia attended with fainting, reaching to vomit, and vomiting itself. Hence it proceeds to the membranes of the spinal marrow, the coats of the arteries, producing horrors, a languid, small, contracted, quick pulse, and even fainting. All which are generally signs and symptoms of the plague, which are of a more violent and quick operation in proportion to the virulence of the pestilential miasma. This disease differs from other contagious, malignant, and eruptive fevers, because it is the most acute, and sometimes kills on the first, and sometimes on the second day. In our climate it is not epidemic or sporadic, from a bad way of living, or an unhealthful air, but happens when it is most salutary, from contagion alone, and

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is imported from hot countries where this disease rages. It will not only abate by intense cold, but be perfectly extinguished: wherefore in a cold season and very cold countries, it either does not appear at all, or in a very mild degree; whereas if the climate is hot, it is not only most violent, but most common.

All plagues are not of the same nature, but vary according to different constitutions and circumstances; but all who have written of the plague universally agree, that spongy and porous bodies, of an obese habit, of a sanguine and phlegmatico-sanguine constitution, women, young persons and children, persons of a timid disposition, that are poor, live hard, or are given to luxury, and sit up late at night, are more apt to be afflicted with this disease than the strong and intrepid, lean, nervous, endued with large vessels, men, old persons obnoxious to the hemorrhoidal flux, and who have issues and open ulcers. Nothing brings on this distemper sooner than fear, a dread of death, and a consternation of the mind. If the pestilential poison is not expelled to the external parts, it is certainly fatal; nor is this to be done, according to Hoffman, as in other fevers, by large sweats, by stools, by a flux of urine, by bleeding at the nose, either natural or artificial; for these threaten destruction. The salutary and critical excretion which perfectly solves the pestilential disease is by tumours in the surface of the body, not otherwise than the erysipelas, between the third and fourth day, and the sooner the better, because then the symptoms are mitigated. That there is poison contained in these tumours appears from hence, that if the surgeon opens any of the tumours with his lancet, and then bleeds a sound man with the same, he will be immediately seized with the plague.

PLAIN, *Planus*, whatever is smooth and even, or simple, obvious, and easy to be understood; and, consequently, stands opposed to rough, enriched, or laboured.

A plain figure, in geometry, is an uniform surface; from every point of whose perimeter, right lines may be drawn to every other point in the same.

A plain angle is one contained under two lines, or surfaces, in contradistinction to a solid angle. See *Angle*.

The doctrine of plain triangles, as those included under three right lines, is

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termed plain trigonometry. See *Trigonometry*.

PLAIN Sailing. See *Sailing*.

PLAIN Table, in geometry, &c. an instrument used in the surveying of lands, whereby the plan is taken on the spot, without any future protraction.

PLAIN Problem, in mathematics, such a problem as cannot be solved geometrically, but by the intersection either of a right line and a circle, or of the circumferences of two circles; as, given the greatest side, and the sum of the other two sides of a right angled triangle, to find the triangle, as also to describe a trapezium that shall make a given area of four given lines. Such problems can only have two solutions, in regard a right line can only cut a circle, or one circle cut another in two points.

PLAINT, in law, the exhibiting any action, real or personal, in writing. See *Action*.

PLAISE, the English name of a species of the pleuronectes, with smooth sides, a spine near the anus, and the eyes and six tubercles placed on the right side of the head: it is somewhat larger than the flounder.

PLAN, the representation of something drawn on a plane: such are maps, charts, ichnographies, &c. The term plan, however, is particularly used for a draught of a building, such as it appears, or is intended to appear, on the ground; shewing the extent, division, and distribution of its area, or ground-plot, into apartments, rooms, passages, &c.

A geometrical plan is that wherein the solid and vacant parts are represented in their natural proportions.

The raised plan of a building is the same with what is otherwise called an elevation or orthography.

A perspective plan is that exhibited by degradations, or diminutions, according to the rules of perspective.

To render plans intelligible, it is usual to distinguish the massives with a black wash; the projectures on the ground are drawn in full lines, and those supposed over them in dotted lines. The augmentations, or alterations to be made, are distinguished by a colour different from what is already built; and the tints of each plan made lighter, as the stories are raised.

In large buildings, it is usual to have three several plans, for the three first stories,

PLANE,

PLANE, *Planum*, in geometry, a plain surface, or one that lies evenly between its bounding lines: and as a right line is the shortest extension from one point to another, so a plane surface is the shortest extension from one line to another. In astronomy, conics, &c. the term plane is frequently used for an imaginary surface, supposed to cut and pass through solid bodies; and on this foundation, is the whole doctrine of conic sections built. In mechanics, planes are either horizontal, that is, parallel to the horizon, or inclined thereto.

The determining how far any given plane deviates from an horizontal one, makes the whole business of levelling. In optics, the planes of reflection and refraction are those drawn through the incident and reflected or refracted rays. The plane of the horopter is that drawn through the horopter, perpendicularly to the plane of the two optical axes. See *Horopter*.

In perspective, we meet with the perspective plane, which is supposed to be pellucid, and perpendicular to the horizon; the horizon plane, supposed to pass through the spectator's eye, parallel to the horizon; the geometrical plane, likewise parallel to the horizon, whereon the object to be represented is supposed to be placed, &c.

The plane of projection, in the stereographic projection of the sphere, is that on which the projection is made; corresponding to the perspective plane.

PLANE, in joinery, an edge-tool to shave wood smooth and even.

PLANET, *Planeta*, in astronomy, a celestial body revolving round the sun as a center, and changing its position with respect to the fixed stars. The planets are usually distinguished into primary and secondary.

Primary PLANETS, those which move round the sun as a center, and are by way of eminence, usually called planets.

Secondary PLANETS, or satellites, such as move round some primary planet, as their respective center, in the same manner as the primary planets do round the sun. The primary planets are six in number, viz. Saturn, Jupiter, Mars, the Earth, Venus, and Mercury. Of these the first three are called superior planets, because their orbits circumscribe that of the earth; and the two last inferior planets, because their orbits are circumscribed by the orbit of the earth. The order,

position, magnitude, &c. of the planets are represented in plate XLII.

From the several phases and appearances of the planets, they are found to be all perfectly like the moon, that is, opaque bodies, and borrow all their light from the sun.

This will plainly appear from the following particulars: 1. Venus, observed with a telescope, is rarely found full, but with variable phases like those of the moon, her illuminated part still turned towards the east, when she is the morning star, and west, when the evening star. And the like phases have been observed of Mars and Mercury.

2. Gassendus first, and after him others, have observed Mercury on the face of the sun, across which he appeared to pass like a black round spot. Horrox, in 1639, also observed Venus in the sun, where she made the same appearance.

3. De la Hire, in 1700, with a telescope of sixteen feet, discovered mountains in Venus, larger than those of the moon.

4. Cassini observed two spots in Venus; four in Mars, likewise observed by Campani; and several, at several times, in Jupiter; and from his observations of these spots found that they had a rotation round their axes: he even determined the velocity of that rotation, or the period wherein it was effected, v. gr. that of Jupiter 9 hours 56'; that of Mars, 24 hours 40'; and that of Venus 24 hours. And since the sun, moon, Jupiter, Mars, Venus, and the Earth, are found to revolve on their axes, i. e. to have a diurnal rotation, no doubt Mercury and Saturn have the same; though the great nearness of the former to the sun, and the great distance of the latter, prevent any spots from being observed on them, whence that rotation might be demonstrated.

5. In Jupiter are observed two swaths, or belts, brighter than the rest of his disk, and moveable; sometimes found in one part, sometimes in another; sometimes broader, sometimes narrower.

6. In 1609, were first observed three little stars, or moons, moving about Jupiter, by Sim. Marius; and in 1610 the same were observed by Galileo: these are now frequently observed to disappear in a clear sky, when Jupiter happens to be diametrically interposed between them and the sun. Whence it appears they are void of light, at such time when the sun's



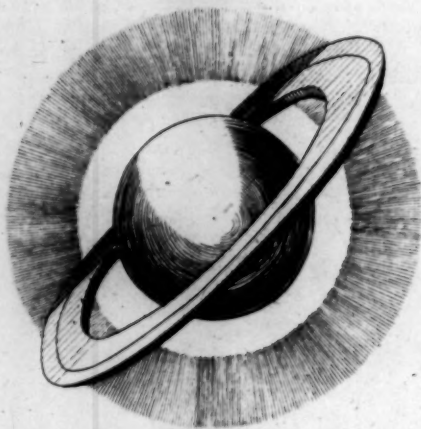
The EARTH



VENUS



SATURN



MERCURY



The MOON



MARS



sun's rays, intercepted by Jupiter, cannot be propagated to them in right lines; and hence also, that, like the moon, they are opaque bodies, illuminated by the sun; and hence again, since Jupiter does not illuminate his satellites when placed behind, he himself in that part turned from the sun, may be argued to be void of light.

7. When Jupiter's moons are diametrically interposed between Jupiter and the sun, there is seen a round spot on Jupiter's disk, which is sometimes larger than the satellite itself. Whence it appears, that the satellites are opaque bodies, illuminated by the sun; that they project a shadow upon the planet, and that the round spots seen in Jupiter are the shadows of the satellites. Whence also, the intersection of that shadow being found to be a circle, the shadow must be conical; and therefore the figure of the satellites; at least as to sense, is spherical.

8. The earth being between Jupiter and the sun, if, at the same time, any of the satellites happen to be between Jupiter and the sun, it is lost in Jupiter's light, though sometimes appearing like a black spot. This phenomenon has been frequently observed by Cassini and Maraldi, who have likewise noted very considerable alterations in the apparent magnitudes of the satellites; for which no reason could be given from the distance of Jupiter, the sun, or the earth: e. gr. That the fourth, which is usually seen the smallest, is sometimes the largest, and the third, which is usually the largest, sometimes the smallest. Hence, as the satellites are illuminated by the sun, even then when emerged in Jupiter's light yet appear obscure, there must be some alteration in their atmospheres, to prevent the sun's rays being equally reflected from every part of their surface; which must likewise be the cause why their shadow is sometimes larger than themselves.

Now, to sum up the evidence. 1. Since in Venus, Mercury, and Mars, only that part of the disk illuminated by the sun is found to shine; and, again, Venus and Mercury, when between the earth and the sun, appear like dark spots or maculae on the sun's disk; it is evident, that Mars, Jupiter, and Mercury, are opaque bodies, illuminated with the borrowed light of the sun. And the same appears of Jupiter, from its being void of light in that part to which the shadow

of the satellites reaches, as well as in that part turned from the sun; and that his satellites are opaque and reflect the sun's light, is abundantly shewn. Wherefore, since Saturn, with his ring and satellites, only yield a faint light, fainter considerably than that of the fixed stars, though these be vastly more remote; and than that of the rest of the planets: it is past doubt, he too, with his attendants, are opaque bodies.

2. Since the sun's light is not transmitted through Mercury and Venus, when placed against him, it is plain they are dense opaque bodies; which is likewise evident of Jupiter, from his hiding the satellites in his shadow; and therefore, by analogy, the same may be concluded of Saturn.

3. From the variable spots in Venus, Mars, and Jupiter, it is evident those planets have a changeable atmosphere; which changeable atmosphere may, by a like argument, be inferred of the satellites of Jupiter, and therefore by similitude the same may be concluded of the other planets.

4. In like manner, from the mountains observed in Venus, the same may be supposed in the other planets.

5. Since then Saturn, Jupiter, both their satellites, Mars, Venus and Mercury, are opaque bodies, shining with the sun's borrowed light, are furnished with mountains, and encompassed with a changeable atmosphere; they have, of consequence, waters, seas, &c. as well as dry land, and are bodies like the moon, and therefore like the earth.

And hence nothing hinders but that the planets may also be concluded to be inhabited. Huygens, in his Cosmotheoros, argues very plausibly for the existence of planetary inhabitants, from the similitude of the planets with our earth; those, like this, being opaque, dense, uneven, round, heavy, illuminated and warmed by the sun; having night and day, summer and winter, &c.

Wolffius deduces something relating hereto from arguments of another kind. Thus, e. gr. it is scarce to be doubted, that the inhabitants of Jupiter are much larger than those of the earth; and in effect, of the giant kind. For it is shewn in optics, that the pupil of the eye contracts in a strong light, and dilates in a weak one; wherefore, since in Jupiter the sun's meridian light is much feebler than on the earth, by reason of Jupiter's greater distance from the sun; the pupil

will need to be much more dilatable in the inhabitants of Jupiter, than in those of the earth. But the pupil is observed to have a constant proportion to the ball of the eye, and the eye to the rest of the body; so that, in animals, the larger the pupil, the larger the eye and the larger the body.

In the Copernican system, the proportion between the semi-diameters of the planetary orbits, or between the distances of the several planets from the sun, is found by trigonometry; so that if the distance of any one of them, as for instance, if the distance of the earth from the sun be given, the distances of all the rest of the planets from the sun may be found: in any of the superior planets, the ratio its distance from the sun bears to the distance of the earth from the sun is known, by measuring the angle of the planet's retrogradation.

We have hitherto considered the phenomena of the heavenly bodies without regard to the accurate form of their orbits, which is not circular, but elliptical; yet that it is very little so, even in the most excentric orbit, as that of Mercury, will appear by comparing their excentricities with their mean distances from the sun. Thus, suppose the mean distance of the earth from the sun be divided into 1000 equal parts, then in those parts we have,

In

Merc. CS : DS ::	80 : 387 ::	1 : 4,84
Venus CS : DS ::	5 : 723 ::	1 : 144,6
Earth CS : DS ::	17 : 1000 ::	1 : 19
Mars CS : DS ::	141 : 1524 ::	1 : 10,8
Jupit. CS : DS ::	250 : 5201 ::	1 : 20,8
Satur. CS : DS ::	547 : 9538 ::	1 : 17,4

That the earth's orbit is elliptical, is well known from common experience; for were the orbit circular, the sun's apparent diameter would always be the same; but we find it is not, for if it be measured with a micrometer in winter-time, it will be found considerably larger than in the summer, and it will be greatest of all when the sun is in the 8° of ♊ (which shews that is the place of the aphelium) it being then 31' 47"; whereas, when the sun is in the 8° of ♍, his diameter is but 31' 40".

Hence it is evident that the sun is really nearer to us in the midst of winter than in the midst of summer; but this seems a paradox to many, who think the sun must needs be hottest when it is nearest to us, and that the sun is apparently more distant from us in December

than in June. As to the sun's being hotter, it is true, it is so to all those places which receive his rays directly or perpendicularly, but we find his heat abated on account of the obliquity of the rays, and his short continuance above the horizon at that time. And as to his distance, it is only with respect to the zenith of the place, not the center of the earth; since it is plain, the sun may approach the center of the earth, at the same time that it recedes from the zenith of any place.

Agreeable to the sun's nearer distance in the winter, we observe his apparent motion is then quicker than in summer; for in the 8° of ♊ it is about 61' per day, but in the 8° of ♍ his motion is but 57' per day. Accordingly, we find the summer half-year eight days longer than the winter half-year, as appears by the following computation, according to the new style.

In March 10½ days.	In Sept. 07 days.
April 30	Octob. 31
May 31	Nov. 30
June 30	Dec. 31
July 31	Jan. 31
Aug. 31	Feb. 28
Sept. 23	March 20½
186½	178½
178½	

Difference 8 days.

For the sun's attracting force being one part of the cause of the planet's motion, and this force always increasing and decreasing in the inverse ratio of the squares of the distances, it is evident the velocity of the planet will always be greater the nearer it is to the sun, and *vice versa*.

Yet is this unequal motion of a planet regulated by a certain immutable law, from which it never varies, which is, that a line, drawn from the center of the sun to the center of the planet, does so move with the planet about the sun, that it describes elliptic areas always proportional to the times.

PLANETARIUM, an astronomical machine, representing the motions, orbits, &c. of the planets, agreeably to the Copernican system. The planetarium is more generally known by the name orrery, and therefore we have given its description and use under that article. See *Orrery*.

PLANETARY, relating to the planets.

nets. Thus we meet with planetary days, hours, years, systems, &c.

PLANIMETRY, that part of geometry which considers lines and plain figures, without considering their height or depth.

PLANISPHERE, a projection of the sphere and its various circles on a plane; in which sense maps, wherein are exhibited the meridians, and other circles of the sphere, are planispheres.

PLANISPHERE is more particularly used for an astronomical instrument used in observing the motions of the heavenly bodies. It consists of a projection of the celestial sphere upon a plane, representing the stars, constellations, &c. in their proper order; some being projected on the meridian, and others on the equator.

PLANT, *planta*, an organical body, destitute of sense and spontaneous motion, adhering to another body in such a manner as to draw from it its nourishment, and having power of propagating itself by seeds. The parts of which a plant consists are, the root, stalk, leaf, flower, and fruit. Plant and vegetable are terms almost synonymous, every plant being a vegetable. Dr. Boerhaave defines a vegetable to be a body generated of the earth, or something arising of the earth, to which it adheres or is connected by parts called roots, through which it receives the matter of its nourishment and increase: and consists of juices and vessels sensibly distinct from each other: or, a vegetable is an organical body, composed of vessels and juices every where distinguishable from each other; to which body grow roots or parts, whereto it adheres, and from which it derives the matter of its life and growth. This definition furnishes a just and adequate idea of a vegetable; for by its consisting of distinct vessels and juices, it is distinguished from a fossil; and by its adhering to another body, from which it derives its nourishment, and being destitute of sensation, it is sufficiently distinguished from an animal. The vessels, or containing parts of plants, consist chiefly of earth, bound or connected together by oil, as a gluten; which being exhausted by fire, air, age, or the like, the plant moulders, or returns again into its earth or dust; but it must be owned, that water, air, salt, and sulphur, or oil, are likewise constituent parts of plants, since they can be all obtained by a well managed analysis. The root, or part whereby plants are connected to their matrix, and

by which they receive their nutritious juice, consists of an infinite number of absorbent vessels, which being dispersed through the interstices of the earth, attract or imbibe the juices of the same; consequently every thing in the earth that is dissoluble in water is liable to be imbibed, as air, salt, oil, and fumes of minerals, metals, &c. and of these plants do really consist. See *Root*.

The motion of these nutritious juices is not unlike that of the blood in animals, being effected by the action of the air. The discovery of this we owe to the admirable Malpighi, who first observed, that plants consist of two series or orders of vessels: 1. Such as receive and distribute the alimentary juices, answering to the arteries, lacteals, veins, &c. of animals. 2. The tracheæ, or air-vessels, which are long hollow pipes, wherein air is commonly received and expelled; that is, inspired and expired. Hence it follows, that the heat of the sun must have a strong effect on the air included in these tracheæ; whence arises a perpetual spring of action, to promote the circulation of the juices in plants.

For the botanical distribution of plants into classes, genera, &c. see the articles *Botany*, *Genus*, &c.

Fossile PLANTS, those plants found buried in the earth, and lodged in almost all the kinds of strata, or substances, to be met with there.

PLANTAIN, *Plantago*, in botany, a plant, the root, leaves, and seeds of which are used in medicine, and reckoned cooling and astringent; being much recommended in fluxes of all kinds, particularly hæmorrhages, whether from the nose, mouth, or uterus. It is likewise accounted a great healer of fresh wounds.

Ribwort, and bucks-horn plantain, are two species of, and agree with plantain in virtues.

PLANTATION, in the West Indies, denotes a spot of ground which a planter, or person arrived in a new colony, pitches on to cultivate for his own use, or is assigned for that purpose. Plantation is often used in a synonymous sense with colony.

PLANTING, in agriculture and gardening, is setting a tree or plant, taken from its proper place, in a new hole or pit; throwing fresh earth over its root, and filling up the hole to the level of the surface of the ground.

The first thing in planting, says Mr. Miller, is to prepare the ground before

the trees or plants are taken out of the earth, that they may remain out of the ground as short a time as possible; and the next is, to take up the trees or plants in order to their being transplanted. In taking up the trees, carefully dig away the earth round the roots, so as to come at their several parts to cut them off; for if they are torn out of the ground without care, the roots will be broken and bruised, to the great injury of the trees. When you have taken them up, the next thing is to prepare them for planting by pruning the roots and heads. And first, as to the roots; all the small fibres are to be cut off, as near to the place from whence they are produced as may be, except they are to be replanted immediately after they are taken up. Then prune off all the bruised or broken roots, all such as are irregular, and cross each other, and all downright roots, especially in fruit-trees: short n the larger roots in proportion to the age, the strength, and nature of the tree, observing that the walnut, mulberry, and some other tender-rooted kinds, should not be pruned so close as the more hardy sorts of fruit and forest trees: in young fruit-trees, such as pears, apples, plums, peaches, &c. that are one year old from the time of their budding and grafting, the roots may be left only about eight or nine inches long; but in older trees they must be left of a much greater length; but this is only to be understood of the larger roots, for the small ones must be chiefly quite cut out, or pruned very short. The next thing is the pruning of their heads, which must be differently performed in different times; and the design of the trees must also be considered: thus, if they are designed for walls or espaliers, it is best to plant them with the greatest part of their heads, which should remain on till they begin to shoot in the spring, when they must be cut down to five or six eyes, at the same time taking care not to disturb the roots. But if the trees are designed for standards, you should prune off all the small branches close to the place where they are produced, as also the irregular ones, which cross each other; and after having displaced these branches, you should also cut off all such parts of branches as have by any accident been broken or wounded; but by no means cut off the main leading shoots, which are necessary to attract the sap from the root, and thereby promote the growth of the tree.

Having thus prepared the trees for planting, you must now proceed to place them in the earth; but first, if the trees have been long out of the ground, so that the fibres of the roots are dried, place them eight or ten hours in water, before they are planted, with their heads erect, and the roots only immersed therein, which will swell the dried vessels of the roots, and prepare them to imbibe nourishment from the earth. In planting them, great regard should be had to the nature of the soil; for if that be cold and moist, the trees should be planted very shallow; and if it be a hard rock or gravel, it will be better to raise a hill of earth where each tree is to be planted, than to dig into the rock or gravel, and fill it up with earth, as is too often practised, by which means the trees are planted, as it were, in a tub, and have but little room to extend their roots. The next thing to be observed is to place the trees in the hole in such a manner that the roots may be about the same depth in the ground as before they were taken up: then break the earth fine with a spade, and scatter it into the hole, so that it may fall in between every root, that there may be no hollowness in the earth; then, having filled up the hole, gently tread down the earth with your feet, but do not make it too hard, which is a great fault, especially if the ground be strong or wet. Having thus planted the trees, they should be fastened to stakes driven into the ground, to prevent their being displaced by the wind, and some mulch laid on the surface of the ground about their roots: as to such as are planted against walls, their roots should be placed about five or six inches from the wall, to which their heads should be nailed to prevent their being blown up by the wind. The seasons for planting are various, according to the different sorts of trees, or the soil in which they are planted: for the trees whose leaves fall off in winter, the best time is the beginning of October, provided the soil be dry; but if it be a very wet soil, it is better to defer it till the latter end of February, or the beginning of March; and for many kinds of evergreens, the beginning of April is by far the best season; though they may be safely removed at Midsummer provided they are not to be carried very far; but you should always make choice of a cloudy wet season. *Miller's Gardener's Dict.*

PLASHING of *Quickset-Hedges*, an operation very necessary to promote the growth and continuance of old hedges. It is performed in this manner: the old stubs must be cut off, &c. within two or three inches of the ground, and the best and longest of the middle sized shoots left to lay down. Some of the strongest of these must also be left to answer the purpose of stakes. These are to be cut off to the height at which the hedge is intended to be left; and they are to stand at ten feet distance one from another: when there are not proper shoots for these at the due distances, their places must be supplied with common stakes of dead wood. The hedge is to be first thinned, by cutting away all but those shoots which are intended to be used either as stakes, or the other work of the plashing: the ditch is to be cleaned out with the spade: and it must be now dug as at first, with sloping sides each way; and when there is any cavity on the bank on which the hedge grows, or the earth has been washed away from the roots of the shrubs, it is to be made good by facing it, as they express it, with the mould dug from the upper part of the ditch: all the rest of the earth dug out of the ditch is to be laid upon the top of the bank, and the owner should look carefully into it that this be done; for the workmen, to spare themselves trouble, are apt to throw as much as they can upon the face of the bank; which being by this means overloaded, is soon washed off into the ditch again, and a very great part of the work undone; whereas what is laid on the top of the bank always remains there, and makes a good fence of an indifferent hedge. In the plashing the quick, two extremes are to be avoided; these are, the laying it too low, and the laying it too thick: this makes the sap run all into the shoots, and leaves the plashes without sufficient nourishment; which, with the thickness of the hedge, finally kills them. The other extreme of laying them too high is equally to be avoided; for this carries up all the nourishment into the plashes, and so makes the shoots small and weak at the bottom, and consequently, the hedge thin. A new hedge raised from sets in the common way, generally requires plashing about eight or nine years after.

PLASTER, *Emplastrum*, in pharmacy, an external application, of a harder consistence than our ointments: these are to be spread according to the different

circumstances of the wound, place, or patient, either upon linen or leather.

PLASTER, among builders, &c. The plaster of Paris is a preparation of several species of gypsums, dug near Mont Maitre, a village in the neighbourhood of Paris; whence the name. See *Gypsum*.

The best sort is hard, white, shining, and marbly; known by the names of plaster-stone, or parget of Mont Maitre. It will neither give fire with steel, nor ferment with aqua-fortis, but very freely and readily calcines in the fire, into a very fine plaster; the use of which in building and casting statues, is well known. See *Succo*.

As the modern taste runs greatly into plastering, it were to be wished that this art could be brought to its ancient perfection. The plasters of the Romans were exceeding durable; witness several yards of it still to be found on the top of the Pont de Garde, near Nîmes. At Venice they use a very durable plaster; but as the secret of preparing it is not known among us, it would be worth while to try whether such a substance might not be made by boiling the powder of gypsum dry over the fire, for it will boil in the manner of water; and when this boiling or recalcining was over, the mixing with it resin, or pitch, or both together, with common sulphur, and the powder of sea-shells. If these were all mixed together, and the water added to it hot, and the matter all kept hot upon the fire till the instant of its being used, so that it might be laid on hot, it is possible this secret might be hit upon. Wax and oil of turpentine may be also tried as additives; these being the common ingredients in such cements as we have accounts of are the firmest. Strong ale-wort is by some directed to be used, instead of water, to make mortar of lime-stone be of a more than ordinary strength. It is possible that the use of this tenacious liquor in the powdered ingredients of this proposed plaster, might greatly add to their solidity and firmness.

PLASTIC, *πλαστικός*, denotes a thing endued with a formative power, or a faculty of forming and fashioning a mass of matter, after the likeness of a living being; such a virtue as some of the ancient Epicureans, and perhaps the Peripatetics too, imagined to reside in the earth, or, at least, to have anciently resided therein, by means whereof, and without any extraordinary intervention of a crea-

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a creator, it put forth plants, &c. Some of them seem to be of opinion, that animals, and even man himself, was the effect of this plastic power.

PLASTICE, the **PLASTIC ART**, a branch of sculpture, being the art of forming figures of men, birds, beasts, fishes, &c. in plaster, clay, fluc, or the like.

PLATE, in commerce, gold or silver wrought into vessels, for domestic uses.

PLATFORM, in the military art, an elevation of earth, on which cannon is placed, to fire on the enemy; such are the mounts in the middle of curtains. On the rampart there is always a platform, where the cannon are mounted. It is made by the heaping up of earth on the rampart, or by an arrangement of madders, rising insensibly, for the cannon to roll on, either in a casemate, or on attack in the out works.

All practitioners are agreed, that no shot can be depended on, unless the piece can be placed on a solid platform; for if the platform shakes with the first impulse of the powder, the piece must likewise shake, which will alter its direction, and render the shot uncertain.

PLATFORM, in architecture, a row of beams, which support the timber-work of a roof, and lie on the top of the wall, where the entablature ought to be raised. This term is also used for a kind of terrace, or broad, smooth, open walk at the top of a building, from whence a fair prospect may be taken of the adjacent country. Hence an edifice is said to be covered with a platform, when it is flat at top and has no ridge. Most of the Oriental buildings are thus covered, as were all those of the ancients.

PLATONIC, something relating to Plato, his school-philosophy, opinions, or the like: thus, Platonic love denotes a pure spiritual affection, for which Plato was a great advocate, subsisting between the different sexes, abstracted from all carnal appetites, and regarding no other object but the mind and its beauties: or it is even a sincere disinterested friendship subsisting between persons of the same sex, abstracted from any selfish views, and regarding no other object than the person, if any such love or friendship has aught of a foundation in nature.

PLATONIC YEAR, or the **GREAT YEAR**, a period of time determined by the revolution of the equinoxes, or the space wherein the stars and constellations return to their former places, in respect

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of the equinoxes. The Platonic year, according to Tycho Brahe, is 25816, according to Ricciolus 25920, and according to Cassini 24800 years. See *Precession of the Equinoxes*.

This period once accomplished, it was an opinion among the ancients, that the world was to begin anew, and the same series of things to turn over again.

PLATONISM, the doctrine and sentiments of Plato and his followers.

PLATTOON, or **PLOTTOON**, in the military art, a small square body of forty or fifty men, drawn out of a battalion of foot, and placed between the squadrons of horse, to sustain them; or in ambuscades, freights, and defiles, where there is not room for whole battalions or regiments. Platons are always used when they form the hollow square, to strengthen the angles. The grenadiers are generally posted in platoons.

PLEA, in law, what either party alleges for himself in court, in a cause there depending; and, in a more restrained sense, the defendant's answer to the plaintiff's declaration. Pleas are usually divided into those of the crown, and common pleas. Pleas of the crown are all suits in the king's name, or in the name of the attorney-general on his behalf, for offences against his crown and dignity, and against his peace; as treason, murder, felony, &c. Common pleas are such suits as are carried on between common persons, in civil cases. These pleas may be divided into as many branches as there are actions. To an action there is either a general or a special plea: and here a general plea is a general answer to the declaration; as in a debt or contract, the general plea is, that he owes nothing, in a debt upon bond, that it is not his deed, or he paid it on the day; in an action on a promise, that he made no promise; and in a trespass, not guilty. Special pleas are either in bar to the action brought, or in abatement of the writ on which the action is framed. All pleas are to be succinct, without any unnecessary repetitions, and must be direct and pertinent to the case.

PLEADING, in law, a speech uttered at the bar, in defence of a cause: but, in a stricter sense, the allegations of the parties to a suit, made after the declaration, till the issue is joined. In this sense they express what is contained in the bar, replication, and rejoinder; and not what is in the declaration itself.

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Hence defaults in the matter of declaration are not confined within the mispleading. From the Conquest all pleading was performed in French, till the reign of Edward III. when it was appointed that the pleas should be pleaded in English; but that they should be entered or recorded in Latin.

PLEASURE and **Pain**, says Mr. Locke, are simple ideas, which we receive both from sensation and reflection; there being thoughts of the mind, as well as sensation accompanied with pleasure or pain. See *Pain*.

There are a great many modes of pleasure and pain, which result from the various considerations of good and evil, whether natural or moral, and the passions thereby excited. Pleasure and pain seem to be the means made use of by nature, to direct us in the pursuit of happiness; since pleasure is annexed to whatever contributes thereto, and pain is the companion of what tends to our ruin. Hence it is, that the pleasures of a child, a youth, a grown person, and an old man, all vary, according to the different things required by nature in each state, whether simply for the preservation of the individual, or for that and propagation jointly.

PLEBEIAN, *Plebeius*, a person of the rank of the common people. It is chiefly used in speaking of the ancient Romans, who were divided into senators, knights, and plebeians or commons.

PLEBISCITUM, in Roman antiquity, a law enacted by the common people, at the request of the tribune, or other plebeian magistrate, without the intervention of the senate; but more particularly denotes the law which the people made, when they retired to the Aventine mount.

PLEDGE, *Plegius* in common law, a surety, either real or personal, which the plaintiff is to find, for prosecuting the suit.

PLEDGET, **BOLSTER**, or **COMPRESS**, *Plumaculus*, in surgery, a kind of flat tent, laid over a wound to imbibe the superfluous humours, and keep it clean. See *Wound*.

PLEIADES, *Virgilie*, in astronomy, an assemblage of seven stars in the neck of the constellation Taurus.

* **PLEIADES**, in fabulous history, the seven daughters of Atlas, king of Mauritania, and Pleione, were thus called from their mother. They were

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Maia, Electra, Taygete. Asterope, Merope, Halecyone, and Celano, and were also called Atlantides, from their father Atlas. They were carried off by Busris, king of Egypt; but Hercules having conquered Busris, delivered them to their father; they afterwards however suffered a new persecution from Orion, who pursued them five years, till Jove being prevailed on by their prayers, took them up into the heavens, where they form the constellation which bears their name.

PLENARY, something complete or full.

PLENILUNIUM, in astronomy, that phasis of the moon commonly called the full moon.

PLENIPOTENTIARY, a person vested with full power, to do any thing. See *Ambassador*.

PLENITUDE, *Plenitudo*, the quality of a thing that is full, or fills another.

PLENUM, in physics, according to the Cartesians, that state of things, wherein every part of space is supposed to be full of matter; in opposition to a vacuum.

PLEONASM, *Pleonasmus*, *Redundantia*, a figure in rhetoric, whereby we use words seemingly superfluous, in order to express a thought with the greater energy; such as, "I saw it with my own eyes," "I heard it with my own ears," &c.

PLETHORA, in medicine, a greater redundancy of laudable blood and humours than is capable of undergoing those changes which must necessarily happen for the purposes of life, without inducing diseases. A plethora is cured by venesection, exercise, watching, a sharp and acid diet, after due evacuations, and by a gradual omission of these evacuations.

PLETHORIC, *Pletoricus*, a person abounding with blood, or labouring under a plethora. The use of the pleura is to lubricate and strengthen the whole cavity of the thorax.

PLEURISY, *pleuritis*, in medicine, a violent pain in the side, attended with an acute fever, a cough, and a difficulty of breathing. This disorder affects all the parts of the internal integuments of the thorax, the whole of the pleura, and the whole of the mediastinum; and therefore, when it is seated in the membrane internally lining the ribs, it is called a true or internal pleurisy;

pleurisy; but when it chiefly occupies the external parts, and only the intercostal muscles, and those above them, are affected, it is called a spurious or bastard-pleurisy. The pleurisy is most predominant between the spring and summer. It begins with chillness and shivering, which are soon succeeded by heat, thirst, inquietude, and the other common symptoms of a fever. After a few hours the patient is seized with a violent pricking pain in one of his sides, about the ribs, which sometimes extends itself towards the shoulder-blades, sometimes towards the back-bone, and sometimes towards the fore-parts of the breast, and this is attended with frequent coughing. The matter which the patient spits is at first little and thin, and mixed with particles of blood; but as the disease advances, it is more plentiful and more concocted, but not without a mixture of blood. The pulse is remarkably strong, and seems to vibrate like a tense string of a musical instrument; and the blood drawn from a vein, as soon as it is cold, looks like melted feet. As to the spitting, it is frequently absent; and hence pleurisy is distinguished into moist and dry. As in all inflammatory fevers, so in this, too hot a regimen is to be avoided, both with respect to the bed-cloaths and the heat of the room; nor must the patient be exposed to the cold air, nor drink things actually cold. Hoffman observes, that all strong sudorifics and cathartics are hurtful; and that if the patient has three or four stools, the course of nature must not be stopped. The diet should be cooling, relaxing, slender, and diluting. Moistening things taken warm, are preferable to all others; and hence barley or oatmeal-gruel, sweetened with honey, and also sweet whey, are proper. If the physician is called before the third day, Boerhaave directs a large quantity of blood to be let, from a wide orifice in a large vessel, and to fetch deep sighs, or cough, to promote its celerity; and the part affected should be rubbed gently at the same time, and the bleeding continued till the pain remits, or the patient is ready to faint. This should be repeated as often as the symptoms return, which it was intended to remove, and till the absence of the white inflammatory pellicle from the surface of the blood when cold, shews it is time to leave it off. This Huxham confirms by his own experience, and adds, that after the fourth day, bleeding is not

safe; he likewise recommends fomenting the part, which often eases the pain and terminates the disease: but if it is obstinate, he recommends slight scarifications, then cupping, and afterwards a blister on the same place; which has been successful, when the usual methods failed. The patient's body should be kept open, for which purpose emollient clysters are proper; and he should, at the same time, take large quantities of strong diluting, aperient, and antiseptic liquors: for this purpose, take the leaves of scordium, jack-by-the-hedge, and white-horehound, each two ounces: boil them in two pints of water, with which mix of the oxymel of squills, eight ounces; of nitre, three drams; and of treacle-vinegar, one ounce: of this mixture let the patient, every quarter of an hour, take two ounces, as warm as possible.

Dr. Mead observes, on the treatment of this disorder, that after drawing as much blood as is necessary, draughts with fresh-drawn linseed oil, are of great service for easing the cough; nitre, for allaying the heat; and for dissolving the sily blood that obstructs the small canals, wild goat's blood and volatile salts: and, lastly, a blister laid on the part affected, in order to draw forth the peccant humour.

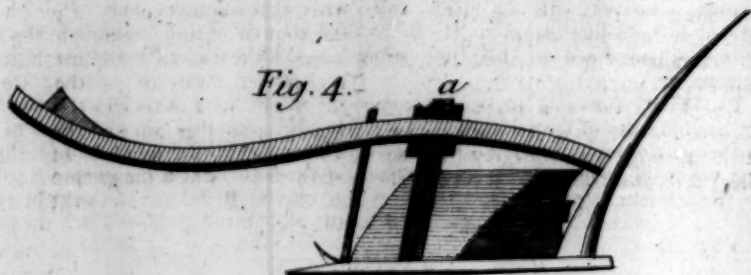
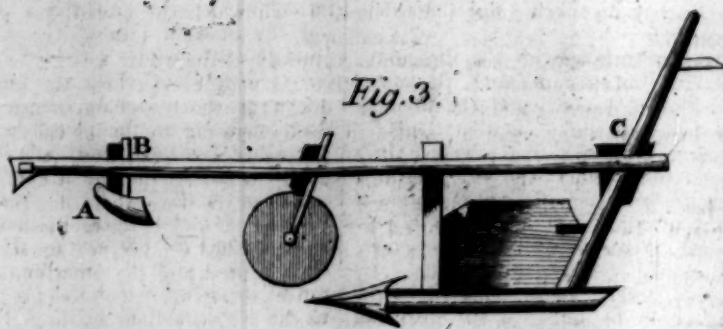
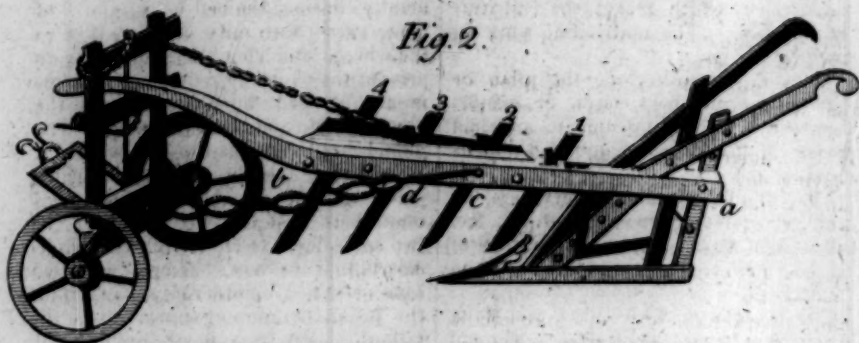
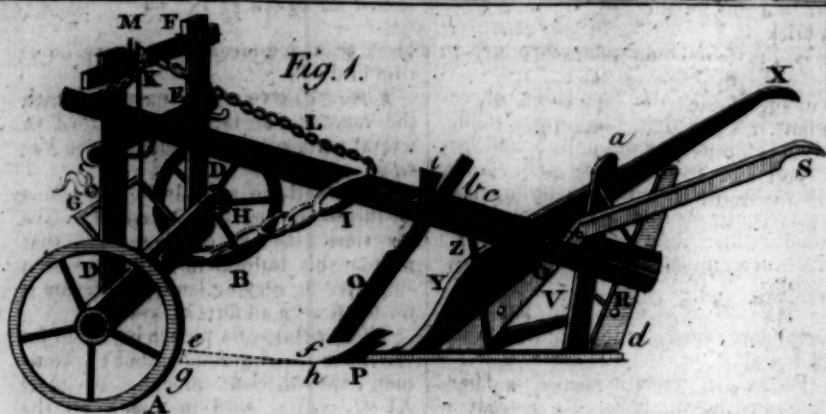
A purulent abscess or empyema is sometimes formed in this disease; for the treatment of which, see *Empyema*.

As to the bastard-pleurisy, Hoffman says, that it is properly a kind of rheumatism, and does not require bleeding unless the patient is pethoric, but a diaphoresis and a more free perspiration. Lancisi, however, advises plentiful bleeding in the arm, scarifying the part affected, and cupping: and during the cure, it is necessary to keep the body open, and the bowels free from spasms; for which purposes, emollient clysters are proper, with oil of sweet almonds.

PICA POLONICA, in medicine, a disease of the hair, almost peculiar to Poland and Lithuania, and hence denominated Polonica. It consists of a preternatural bulk of the hair, which being firmly conglutinated and wrapped up in inextricable knots, and extended to a monstrous length, affords a very unseemly spectacle. When these are cut off, the blood is discharged from them, the head racked with pain, the sight impaired, and the patient's life frequently endangered.

PLINTHE, ORLE, or ORLO, in architecture,





architecture, a flat square member, in the form of a brick.

It is used as the foundation of columns, being that flat square table, under the moulding of the base and pedestal, at the bottom of the whole order. It seems to have been originally intended to keep the bottom of the original wooden pillars from rotting.

Vitruvius also calls the Tuscan abacus, plinth.

PLINTH of a Statue, &c. is a base, either flat, round, or square, that serves to support it.

PLOT, in dramatic poetry, is sometimes used for the fable of a tragedy or comedy, but more particularly the knot or intrigue, which makes the embarrass of any piece. The unravelling puts an end to the plot.

PLOT, in surveying, the plan or draught of any field, farm, or manor, surveyed with an instrument, and laid down in the proper figure and dimensions.

PLOTTING, among surveyors, is the art of laying down on paper, &c. the several angles and lines of a tract of ground surveyed by a theodolite, &c. and a chain.

In surveying with the plain-table, the plotting is saved; the several angles and distances being laid down on the spot, as fast as they are taken. See the article *Plain-Table*.

But, in working with the theodolite, semi-circle, of circumferentor, the angles are taken in degrees; and the distances in chains and links, so that there remains an after-operation to reduce these members into lines, and so to form a draught, plan or map: this operation is called plotting. Plotting then is performed by means of two instruments, the protractor and plotting scale. By the first, several angles observed in the field with a theodolite, or the like, and entered down in degrees in the field-book, are protracted on paper in their just quantity. By the latter, the several distances measured with the chain, and entered down in like manner in the field-book, are laid down in their just proportion.

PLOVER, *Pluralis*, in ornithology, the English name of several distinct birds; as the green plover, or variegated black and yellowish charadrius, about the size of the common lapwing; and the grey plover, or blackish-brown tringa, with a

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black beak and green legs, a very beautiful bird.

Bastard PLOVER, the name by which the vanellus, or lapwing, is called in several parts of the kingdom. See *Vanellus*.

PLOUGH, in agriculture, a machine for turning up the soil, contrived to save the time, labour, and expence, that without this instrument must have been employed in digging land, to prepare it for the sowing all sorts of grain.

The structure of a plough is various for various kinds of grounds; but the common two-wheeled plough, in plate XLIII. fig. 1. used in almost all the counties in the south of England, is generally esteemed the best for all sorts of land, except such miry clays as stick to the wheels, and clog them up so as to prevent their turning round. It is commonly divided into two parts, the plough-head, and the plough-tail. The plough-head contains the two-wheels A B, and their axis, or iron-spindle, which passes through the box C, and turns round both in it and in the wheels; the two crow-staves D D, fastened perpendicularly into the box, having in each two rows of holes, in order to raise or sink the beam, by pinning up or down the pillow E, to increase or diminish the depth of the furrow; the gallowes F, through which the cross-staves pass at top, by mortises into which they are pinned; G the wilds, with its links and crooks of iron, by which the plough is drawn; H the tow-chain, which fastens the plough-tail to the plough-head, by the collar I at one end, and by the other end passing through a hole in the middle of the box, where it is pinned in by the stake K; L the bridle-chain, one end of which is fastened to the beam with a pin, and the other end to the top of the stake, which stake is held up to the left crow-staff, by the end of the with or rope M passing round it above, and under the end of the gallowes below, or by the end of the bridle-chain itself, when that is long enough. The plough-tail consists of the beam, N; the coulter, O; the share, P; and the sheat, Q; the hinder sheat, R, passing through the beam near its end; S, the short handle, fastened to the top of the hinder sheat by a pin, and to the top of the fore-sheat by another pin; T the drock, which belongs to the right-side of the plough-tail, and to which the ground

wrist V is fastened; as is the earth-board, whose fore-part W, is seen before the sheat; as also the long handle X, whose fore-part Y appears before the sheat, and is fastened to the drock by the pin at a, the other end of which pin goes into the beam. Z is the double retch, which holds up the sheat, and passes through the beam to be fastened by its screws and nuts at b and c.

The structure of the four-coultered plough (fig. 2.) is in several respects different from this, though in general founded on it. Its beam is ten feet four inches long, whereas that of the common plough is but eight feet: it differs also in shape; for as the other is straight from one end to the other, this is straight only from a to b, and thence turns up, in the manner shewn in the plate; so that a perpendicular line let down from the corner at a, to the even surface on which the plough stands, would be eleven inches and an half, which is its height in that place; and if another line was let down from the turning of the beam at b, to the same surface, it would be one foot eight inches and a half, which is the height the beam stands from the ground at that part; and a third line let down to the surface from the bottom of the beam, at that part which bears upon the pillow, will shew the beam to be, in that part, two feet ten inches high above the surface. At the distance of three feet two inches from the end of the beam, at the plough-tail, the first coulter, or that next the share, is let through: and at thirteen inches from this, a second coulter is let through: a third at the same distance from that; and finally, a fourth at the same distance from the third. The crookedness of the beam is to avoid the too great length of the fore-most coulters, which would be so long if the beam was straight all the way, that they would be apt to bend and be displaced, unless they were vastly thick and clumsy.

The sheat in this plough is to be seven inches broad, and the fixing the sheat in this, as well as in the common plough, is the nicest part, and requires the utmost art of the maker; for supposing the axis of the beam, and the left side of the share to be both horizontal, they must never be set parallel to each other; but the straight side of the share must make an angle on the left-side of the beam, which must be very acute, that the tail of the share may press less against the side of the trench than the point does: this

angle is shewn by the pricked lines at the bottom of fig. 1. where the line ef is supposed to be the axis of the beam let down to the ground, and the line gb, parallel to the left-side of the share. The great thing to be taken care of, is the placing the four coulters, which must be so set that the four imaginary planes described by the four edges, as the plough moves forwards, may be all parallel to each other, or very nearly so: for if any one of them should be very much inclined to, or should recede much from either of the other, then they would not enter the ground together. In order to the placing them thus, the second coulter-hole must be two inches and a half more on the right-hand than the first; the third must be as much more to the right of the second; and the fourth the same distance to the right of the third: and this two inches and a half must be carefully measured from the center of one hole to the center of the other. Each of these holes is a mortise of an inch and a quarter wide, and is three inches and a half long at the top, and three inches at the bottom. The two opposite sides of the hole are parallel to the top and bottom, but the back is oblique, and determines the obliquity of the standing of the coulter, which is wedged tight up by pieces of wood. The coulters are two feet eight inches long, of which sixteen inches are allowed for the handles, which is to be thus long, that the coulter may be drawn down as the point wears away. As to the wheels, the left-hand wheel is twenty inches diameter, and that on the right hand, two feet three inches; and the distance the wheels are set from each other is two feet five inches and a half.

Besides these three are the Lincolnshire plough, proper for fenny-lands subject to weeds and sedges, and remarkable for the largeness of its share, which is frequently a foot broad and very sharp, (fig. 3.) At A is a foot, which is set higher or lower, by a wedge drove in at B; and which keeps the fore part of the plough from going deeper than they would have it. At C there are wedges by which the hinder part is set. Instead of a coulter there is a wheel with a sharp edge, which cuts the root of the grass or sedge as it turns round, while the broad share cuts them up at the bottom.

But the most common plough, says Mortimer, is the drag-plough, represented in fig. 4. which is best for miry clays, when the land is soft; but is extremely bad

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bad in summer, when the land is hard, because its point will be continually flying out of the ground. Mr. Moore has invented a new plough, for which he has obtained his Majesty's Royal Letters Patent. Some speak well of it, and others very indifferently; but as he has an exclusive right to make it by virtue of his patent, it would be needless to particularize it.

PLOUGHMAN, the person who guides the plough in the operation of tilling.

PLOUGHING, or **PLOWING**, in agriculture, the art of turning up the earth with a plough.

Ploughing is principally either that of lays or of fallows. Ploughing of lays is the first cutting up of grass-ground, for corn, and is a work commonly performed in January. The best time for doing it is when the land is wet, because the turf is then soft and tough, and will turn up without breaking. In the well turning of this consists the chief part of this sort of ploughing, which if rightly performed, will lay the turf so flat and true, that it can hardly be seen where the plough went. This, indeed, depends greatly upon the make of the plough; but if the earth-board does not turn the turf well, some nail upon it a small piece of wood, to take the upper part of the earth as it rises upon the earth-board, which causes it to fall with the grass-side downwards. Ploughing of fallows, called also fallowing, is preparing land by ploughing long before it is ploughed for seed. See the article *Fallowing*.

PLUM-TREE, in botany, a genus of plants, the flower of which consists of five roundish, concave, and large petals: the fruit is a roundish drupe, marked with a longitudinal furrow, and containing a compressed and acute-pointed nut, with the sutures standing out each way in an edge.

PLUMAGE, the feathers which serve birds for a covering.

PLUMBAGO, *Mock-Lead*, in mineralogy, a fossil substance resembling lead-ore, much used in drawing, and for making pencils.

PLUMBERY, the art of casting, preparing, and working of lead, and of using it in buildings, &c.

The lead used in plumbery is furnished from the lead works in large ingots called pigs of lead, usually weighing about a hundred pounds a piece.

As lead melts very easily it is no hard matter to cast figures hereof by running

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it into moulds. But the chief article in plumbery is the sheets and pipes of lead.

PLUMBUM, lead, in natural history. See *Lead*.

PLUMMET, **PLUMB-RULE**, or **PLUMB-LINE**; an instrument used by carpenters, masons, &c. in order to judge whether walls, &c. be upright planes, horizontal, or the like. It is thus called from a piece of lead, *plumbum*, fastened to the end of a cord, which usually constitutes this instrument. Sometimes the string descends along a wooden ruler, &c. raised perpendicularly on another; in which case it becomes a level. See *Level*.

PLUMMING, among miners, the method of using a mine-dial, in order to know the exact place of the work where to sink down an air shaft, or to bring an adit to the work, or to know which way the load inclines when any flexure happens in it.

PLUMOSE, something formed in the manner of feathers, with a stem and fibres issuing from it on each side: such are the antennæ of certain moths, butterflies, &c.

PLURAL, *Pluralis*, in grammar, an epithet applied to that number of nouns and verbs which is used when we speak of more than one thing; or that which expresses a plurality or number of things.

PLURALITY, *Pluralitas*, a discrete quantity, consisting of two, or a greater number of the same kind: thus we say a plurality of gods, &c.

Hence plurality of benefices, or livings, is where the same clerk is possessed of two or more spiritual preferments, with cure of souls.

PLUS, in algebra, a character marked thus +, used for the sign of addition. See *Character*.

PLUSH, in commerce, &c. a kind of stuff having a sort of velvet knap, or shag, on one side, composed regularly of a woof of a single woollen thread and a double warp, the one wool, of two threads twisted, the other goats or camels hair; though there are some plushes entirely of worsted, and others composed wholly of hair.

Plush is manufactured, like velvet, on a loom with three treadles; two of these separate and depress the woollen warp, and the third raises the hair-warp, upon which the workman throwing the shuttle, passes the woof between the woollen and hair-warp; and afterwards laying a brafs

broach, or needle, under that of the hair, he cuts it thereon with a knife destined for that use; conducting the knife on the broach, which is made a little hollow all its length, and thus gives the surface of the plush an appearance of velvet. See *Velvet*.

There are other kinds of plush, all of silk; some of which have a pretty long knap on one side, and some on both.

* **PLUTARCH**, a celebrated Greek historian and philosopher, born at Chæronea, a city of Bœotia, and flourished at the beginning of the second century, under the reign of the emperor Trajan. That prince having a particular esteem for him, honoured him with the consular dignity, and employed him in several important negotiations. Before this time Plutarch had studied under Ammonius, and travelled into Greece and Egypt, in order to consult the learned. In his several voyages, he had taken care to minute down whatever appeared most curious. Towards the close of his life he returned to his native country, where he is supposed to have died under the reign of Antonius Pius, about the year 140. He wrote the lives of the illustrious men of Greece and Rome; Moral Treatises, and several other excellent works, filled with wise and judicious reflections, and with whatever is most curious and worthy of being known in prophane antiquity.

* **PLUTO**, in pagan worship, the king of the infernal regions, was the son of Saturn and Ops, and the brother of Jupiter and Neptune. Pluto finding himself childless and unmarried, mounted his chariot to visit the world, and arriving in Sicily, became enamoured with Proserpine, whom he saw gathering flowers with her companions in the valley of Enna, near Mount Ætna; when forcing her into his chariot, he drove her to the river Chemarus, through which he opened himself a passage back to the realms of night. Pluto is generally represented in an ebony chariot, drawn by four black horses, sometimes holding a scepter to denote his power, at others, a wand to drive away the ghosts; and at others, some keys to signify that he had the keys of death. His helmet, according to Homer, had the quality of rendering the wearer invisible, and that Minerva borrowed it, in order to be concealed from Mars, when he fought against the Trojans. Pluto was greatly revered by the Greeks and Romans, who erected temples and altars to him. To this god sacrifices

were offered in the night, and it was not lawful to offer them by day. Some mythologists suppose, that he was originally a prince who was deified for teaching men to bury their dead, and inventing funeral rites to their honour: others say, he was a king of the Molossians in Epirus; that he stole Proserpine, and kept a dog called Cerberus, who devoured Pirithous, and would have served Theseus in the same manner, if Hercules had not interposed. The Abbe la Pluche maintains, that Pluto was the funeral Osiris of the Egyptians, who every year, at an appointed season, assembled to mourn over, and offer sacrifices to the dead.

* **PLUTUS**, in pagan worship, the god of riches. He was represented as appearing lame when he approached to any mortals, and with wings at his leaving them, to point out the difficulty of amassing wealth, and the uncertainty of its enjoyment. He was also frequently represented blind, to shew that he often bestowed his favours on the least deserving, and left in necessity those who had the greatest merit.

* **PLYMOUTH**, a large sea-port town of Devonshire, with two markets on Mondays and Thursdays; and two fairs, on January 25, and September 21, for horned cattle and woollen-cloth. It is seated on the river Plime, near the Tamer, where they fall into the sea. It has two parish-churches. Its harbour is strongly fortified, and has a pier on the south side. St. Nicholas Isle lies in the middle of the mouth of the harbour; King Charles II. built a citadel here, which is well mounted with great guns, and contains a garrison. It was incorporated, by act of parliament, in 1439, and is governed by a mayor and recorder, who are justices of the quorum; three other justices, nine principal burgesses, and twenty-four common-councilmen; and sends two members to parliament. It has a considerable trade, particularly in pilchards, and has two docks for the royal navy. The dock-yard is the completest in Europe, and the officers houses belonging to it form a uniform, elegant, and handsome row of buildings. The dock and store-rooms are convenient, the river deep, well defended from storms, and capable of receiving the whole royal navy. It is forty-three miles south-west of Exeter, and 215 from London. Long. 4. 28 W. Lat. 50. 26 N.

PNEUMATICS, called also **PNEUMATOLOGY** and **PNEUMATOSOPHY**, among

among the schoolmen, the doctrine and contemplation of spirits and spiritual substances, as God; angels, and the human soul, in which sense pneumatics are the same with what we otherwise call metaphysics.

PNEUMATICS is more commonly used among us, for that part of natural philosophy which treats of the nature and properties of the air; the doctrine and laws of which will be found under the articles *Air*, *Atmosphere*, &c.

PNEUMATOCELE, **HERNIA FLATULENTA**, or **WINDY-RUPTURE**, in surgery and medicine, a species of hernia, which several authors assure us, occurs in practice. The signs by which they tell us it may be discovered are, 1. That upon handling the scrotum it feels like a bladder distended with wind; and that, therefore, 2. it seems to be much lighter than if it contained any humour, appearing also pellucid at the approach of a candle; and, 3. if it be struck by a filip of the finger, it sounds like a bladder which is distended with wind, and struck in the same manner.

PNEUMONICS, in pharmacy, medicines proper in diseases of the lungs, in which respiration is affected. Of this number are sulphur, lungwort, hyssop, ground-ivy, and colt's-foot: they are used in phthises, asthmas, peripneumonies, pleurisies, &c.

POA, meadow-grass, in botany, a genus of plants. This is the most common of all grasses with us, and makes principally the green covering of most of our fields and meadows.

POCKET, in the woollen trade, a larger sort of bag, in which wool is packed up to be sent from one part of the kingdom to another. The pocket contains usually twenty-five hundred weight of wool.

POD, among botanists, a term used to express a pericarpium consisting of two valves, which open from the base to the point, and are separated by a membranaceous partition, from which the seeds hang by a kind of funiculus umbilicalis.

POEM, a composition in verse of a due length and measure. See *Verse and Measure*.

Poems are generally denominated from the subject matter, as the apobaterion, epibaterion, epinicion, epithalamium, genethliac, elegiac, satiric, epitaph, pægyric, lyric, pastoral, &c. and others, from the manner of narration, as epic,

dramatic, &c. to which may be added, odes, eclogues, and idylliums. To this head may also be referred several other compositions of a less serious kind, as the acrostic, enigma, anagram, cento, echo, &c.

POESY, the same with poetry. See *Poetry*.

POET, ~~poetes~~, the author of a poem.

POETICAL, something relating to poetry, or poets, in which sense we say poetical genius, poetical licence, &c.

POETICAL Justice, is chiefly used in respect of the drama, to denote a distribution of rewards and punishments to the several persons at the catastrophe or close of a piece, answerable to the several characters they appeared in.

POETICAL Rising and Setting of the Stars. The three kinds of rising and setting, viz. the cosmical, acronical, and heliacal, were made by the ancient poets referring the rising, &c. of the stars to that of the sun.

POETICS, the doctrine of poetry, or the laws and rules of conducting pieces or compositions of poetry; such is Aristotle's Poetics, a work much valued.

POETRY, the art of composing poems, or pieces in verse: or, as defined by Vossius, the art of representing actions in metre. Vossius thinks that love was the first occasion of poetry, which is not improbable, considering that this affection is coeval with mankind, is universal, and naturally productive of poetry; yet it undoubtedly owes its progress to religion. Dacier indeed calls it the offspring of religion; and it is certain, in the earliest ages of the world, that it was usual to sing hymns to the honour of the gods upon solemn festivals. Du Bos thinks poetry has been employed in all ages, even by the most unpolished nations, to preserve the memory of past events. Its principal aim is to flatter our senses and imagination; for, according to Plato, it awakens the spiritual empire of the soul. Every kind of poetry charms us in proportion to its object, says Du Bos; and to be very affecting, it ought to be very exact. It is not the same with poetry as with other arts, for an ignorant person may judge of poetry by the impression it makes on him; whence all men have a right to give their opinion, and this judgment ought to be founded on experience rather than on argumentation. Poetry is an art where every thing should please. It is not enough

enough to exhibit nature, which in certain places and circumstances is rude and unpleasant; but the poet must choose in her what is beautiful from what is not: whence a poet ought to choose, for the subject of his imitation, something that is naturally affecting. There is a particular rhetoric for poetry, which consists in discerning very precisely what ought to be said figuratively, and what to be spoken simply; and in knowing where ornament is required, and where not: yet the style should be copious, and every species of writing in this art should have a diction proper to itself.

The qualifications necessary for poetry, or which form a good poet, are seldom found united in one person: he must have an extraordinary genius, great natural gifts, a wit just, piercing, solid, and universal; an understanding clear and distinct; an imagination neat and pleasant; an elevation of soul that depends not on art, or study, and which is purely a gift of heaven, and must be sustained by a lively sense and vivacity, a great judgment to consider properly of things, and a vivacity to express them with that grace and abundance which gives them beauty. In fine, to accomplish a poet, is required a temperature of wit and fancy, of strength and sweetness, of penetration and delicacy; but, above all, he must have a sovereign eloquence, and a profound capacity. These are the qualities that must concur together to form the genius of a poet, and sustain his character. The rules of poetry and versifying are taught by art, and acquired by study; but this force and elevation of thought, which Horace calls something divine, and which alone makes the poetry of any value, must be derived from nature, or, according to Aristotle, from some happy transports, to which that author gives the name of madness. Hence the critics conclude, the end of poetry is to please; its cause, either the excellence of the poet's genius, or a poetical fury and transport of the soul, manageable by the judgment; its matter, long and short syllables, and feet composed hereof, with words furnished by grammar; and its form, the arrangement of all these things in just and agreeable verse, expressing the thoughts and sentiments of the author after the manner already mentioned. But after all, how narrow are all these bounds, if we consider poetry in the light wherein the works of Homer and Virgil have set it!

This, which is therefore distinguished by the name of the greater poetry, in contradistinction to the low and simple, or versification, consists principally in fiction, or the invention of fables, in the expressing of things by allegories and metaphors, and in the inventing of actions, under which the truths which the poet has to teach, may be agreeably disguised.

POINT, a term used in various arts.

POINT, *Punctum*, in geometry, as defined by Euclid, a quantity which has no parts, or which is indivisible. Points are the ends or extremities of lines. If a point be supposed to be moved any way, it will, by its motion, describe a line.

POINT, in grammar, a character used to mark the divisions of discourse. A point proper, is what we otherwise call a full stop or period.

The points, or vowel-points, in the Hebrew grammar, are certain characters which, in the writings of that language, serve to mark the vowels. The antiquity of these points make the subject of a celebrated controversy; some maintaining their origin to be the same with that of the Hebrew language, and others asserting them to have been first introduced by Esdras, after the Babylonish captivity, when he compiled the canon, transcribed the books into the present Chaldee character, and restored the purity of the Hebrew text. Some will have them invented by the doctors of the school of Tiberias, usually called the Masoretes, five or six hundred years after Christ.

POINT, in astronomy, a term applied to certain points or places, marked in the heavens, and distinguished by proper epithets.

The four grand points, or divisions of the horizon, viz. the east, west, north, and south, are called the cardinal points.

The zenith and nadir are the vertical points; the points wherein the orbits of the planets cut the plane of the ecliptic, are called the nodes; the points wherein the equator and ecliptic intersect, are called the equinoctial points; particularly that whence the sun ascends towards the north pole, is called the vernal point, and that by which he descends to the south pole, the autumnal point.

POINT of the Horizon, or *Compass*, in navigation and geography. See *Horizon* and *Compass*.

POINTS, in heraldry, the several different parts of an escutcheon, denoting the local positions of any figure.

POINT

POINT is also used in heraldry for the lowest part of the escutcheon, which usually terminates in a point.

POINT is also an iron or steel instrument used with some variety in several arts. Engravers, etchers, cutters in wood, &c. use points to trace their designs on copper, wood, stone, &c.

POINT, in the manufactories, a general term used for all kinds of laces wrought with the needle; such are the point de Venice, point de France, point de Genoa, &c. which are distinguished by the particular economy, and arrangement of their points.

POINT, in poetry, denotes a lively brisk turn, or conceit, usually found or expected at the close of an epigram.

POINT-BLANK, in gunnery, denotes the shot of a gun levelled horizontally. See *Gunnery*.

POINTING, in grammar, the art of dividing a discourse by points, into periods and members of periods, to shew the proper pauses to be made in reading, and to facilitate the pronunciation and understanding thereof.

POINTING, in war, the levelling a cannon, or mortar, so as to play against any certain point.

POISON, in medicine, a malignant quality in some animal, vegetable, or mineral body, which renders it hurtful and even mortal to those who take it.

There are three essential marks of poisons, which distinguish them from other things that are noxious to human bodies. The first is, that they consist of most subtle parts, and are consequently pernicious in a small quantity. The second, that they in a short time prevent the regular motions of the solids and fluids throughout the body, and induce the most grievous symptoms, and even death itself. And the third, that they exercise their cruelty on the most subtle fluids, and the most nervous parts. Poisons are of various kinds, and operate in various manners; some by dissolving the blood, others by coagulating it, and others by corroding and destroying the solid parts. All the three kingdoms have poisons peculiar to themselves; but the animal kingdom affords the most subtle, which are communicated by the bite of mad or venomous beasts, when they are angered. The mineral kingdom produces arsenicals and mercurials. And the vegetable, herbs and plants of a most acrid, noxious, and deleterious quality, such as the most violent cathartics and narcotics. Every

sort of poison seems to have an effect peculiar to itself: thus arsenic occasions the most cruel torments, convulsions, mortification of the coats of the intestines; the seeds of datura induce madness or absolute stupidity; opium brings on sleepiness, and a torpor on the mind; the berries of deadly nightshade produce madness, rage, or folly; litharge, unwarily taken, causes a convulsive colic, with an obstinate costiveness; the bite of a mad dog occasions the dread of water; the venom induced by the sting of a tarantula, produces wonderful effects, for the patient is delighted with musical instruments, and when he hears their sounds, immediately begins capering: the sting of a scorpion produces a sudden chilliness, and exceeding cold sweats. The mineral kingdom furnishes very few real poisons; the only natural one is cobalt; the factitious are arsenic, corrosive sublimate, and glass of antimony. The most dangerous vegetable poisons are the true hemlock, wolf's bane, the deadly nightshade, henbane, and datura, to which may be added the roots of hemlock-dropwort.

Milk mixed with oil is an excellent remedy against all corrosive poisons. Hoffman says, that he once prevented the death of ten young persons, who had taken among them almost 2 ounces of arsenic in water-gruel, which in a short time produced the highest anxieties, and corroding tortures, by oil of sweet almonds and milk. They took at least ten quarts apiece, which they vomited up again before the reaching to vomit ceased. The same author also affirms, that milk, in a large quantity, is an universal remedy against all poisons that kill by inflammation, as hemlock does; and, if taken in time, will prevent their dreadful consequences. Allen thinks a vomit with warm water and oil taken in large draughts, and often repeated, will be of great service; as also warm with fresh butter; milk and oil, or milk and butter; but for fat broths, which he also recommends, or any thing else which requires some time for the preparation, they only allow the poison to take deeper root, and therefore ought not to be waited for. If the above things will not provoke the patient to vomit, oxymel of squills, salt of vitriol, or a decoction of tobacco may be used, as having a more immediate effect. It is hardly safe to give even the most gentle cathartic. The stomach being thus emptied of all, or as much

much as possible of the hemlock, recourse must be had to generous wine and alexipharminics, such as Venice treacle, the bezoardic powder, &c. When there is a suspicion that the coats of the stomach or intestines are corroded or ulcerated, it will not be proper for the patient to use spices or vinegar, nor to indulge in drinking too much wine; but to take a decoction of barley with raisins, and a decoction of china-root, saffraas, &c. The same method is most likely to answer when any deleterious herb or root has been eaten by mistake, though the particular species should not be known: and Hoffman affirms, that when the patient has been stupified by narcotics, the best remedies are vomits mixed with oil.

• **POITIERS, battle near.** This famous battle was fought in the year 1356 ten years after that at Crecy, soon after which there was a truce concluded between the English and the French, but very indifferently observed, for both parties were continually in arms in small bodies and detachments, each reproaching the other with having begun first. Many inroads, slight skirmishes, and sieges happened, with various success on both sides, while the two kings connived at their subjects, till the whole affair became so perplexed, that it was difficult to decide who had the most cause of resentment. However, it is certain that Edward III. the English monarch, signified to the pope, that he was willing to make peace with John I. the French king, and resign his title to the crown of France, on condition that the duchy of Guienne, and county of Ponthieu, should be restored to him as independent sovereignties, and that John should make a cession to him of the lands he had conquered about Calais, and the superiority of Flanders. The archbishop of Canterbury, with the duke of Lancaster, and some other noblemen, had been sent as ambassadors to Guienne, to treat with the French deputies in presence of the pope's legate; but as neither prince would yield any circumstance in favour of the other, little was expected from this negotiation, and both sides prepared for war, which now seemed unavoidable; and which was the less unacceptable to John, as he had lately brought over the Flemings to his interest. In 1355, Edward went over to France, where he ravaged the Boulonnois and Artois, but was obliged to return to the defence of England, which was threatened with an invasion from

Scotland. He left his son Edward to finish his business in France. That prince having refreshed his troops, after the fatigues of a severe campaign, began his march from Bourdeaux, on the 6th day of July 1356, at the head of two thousand men at arms, six thousand archers, and four thousand infantry. Passing through the Agenois, he ravaged Quercy, the Limousin, and Auvergne, fell into Berry, attempted Issodon and Bourges without success, and took Vierzon by assault. Here he first understood that the French king lay encamped at Chartres, with a prodigious army collected from all parts of his kingdom. Suspecting that Edward intended to pass the Loire, and join the duke of Lancaster in Normandy, he had disposed his troops in such a manner as to guard all the towns and passes on that river; and the prince of Wales being informed of this disposition, resolved to turn off on the left to Romarantin, ravage Poitou, and return through Saintonge to Bourdeaux. Three hundred lances, under the command of the lords of Craon and Boucieaut, in attempting to cut off his advanced guard, were defeated, fled to the castle of Romarantin, where, in a few days, they were obliged to surrender at discretion. The prince in his route had taken above six thousand men at arms, who were sent prisoners to Bourdeaux, and laid waste a prodigious tract of country. Marching through part of Touraine and Anjou, south of the Loire, he now entered Poitou; and, on Saturday the 17th day of September, encamped between Beauvoir and Maupertuis, within two leagues of Poitiers. The king of France coming up with an army of sixty thousand horse, besides infantry, called a council of war, in which it was resolved to attack the English next morning. Edward was already so straitened for want of provisions, that in a few days he must have been starved into a surrender; but the French, confiding in their valour, and the vast superiority of their numbers, demanded a battle so eagerly, that John did not think proper to disapprove their ardour and ambition. He divided his army into three bodies; of which the first and most advanced was commanded by his brother, the duke of Orleans; the second was posted on the left, under the conduct of the dauphin, assisted by his brothers Lewis and John; while the king in person, accompanied by his youngest son Philip, commanded a third division, as a body of reserve. This

order being settled, John detached the lords of Ribamont, Landas, and Beaujeu, to view the countenance and disposition of the enemy; whom they found posted among bushes, hedges, and vineyards, so as to be inaccessible in every quarter, but by a narrow lane lined with hedges, behind which a body of English archers was planted, to command the passage. Ribamont advised the king to dismount all his cavalry, except 300 chosen men in complete armour, who should enter the defile, and make way for the attack of the dismounted cavaliers. In consequence of this advice, the three hundred men were armed for this service, and all the rest of the troops ordered to charge on foot, except a few German squadrons, which continued on horseback, to be occasionally employed according to the emergencies of the action. Just when John was going to begin the battle, the cardinal of Perigord, employed by the pope to renew the negotiations between the two crowns, running up to the king, conjured him to spare the lives of so many French gentlemen, which would necessarily be lost in the attack, and allow him to repair to the English camp, where he did not doubt of being able to persuade the prince of Wales to surrender. Having obtained this permission, he hastened to Edward, who being very sensible of his dangerous situation, declared himself ready to accept of any terms that should be consistent with his own honour, and that of his country. When the cardinal returned with this answer, John sent back his troops to their quarters, and the mediator spent the whole day in passing between the two camps, to settle the articles of accommodation. The prince of Wales offered to restore all the places and prisoners he had taken in that campaign, and abstain, for so many years, from carrying arms against the king of France, on condition of being allowed to retire unmolested to Bourdeaux. But John peremptorily insisted upon Edward's surrendering himself prisoner, with an hundred knights; and in that case the English army should be permitted to retire without molestation. The prince, far from subscribing to this article, told the cardinal, that he and his knights should never be taken but in battle; and that he would rather lose his life, than agree to such a proposal. Thus the negotiation was broke off, and both sides prepared for an engagement;

though Edward derived some advantage from this small respite, during which he had rendered his camp more defensible, by means of ditches and palisadoes. On Monday morning, the French army appeared in the order of battle we have already described; and Edward drew up his handful of troops in three divisions, ranged in a close compacted form, with hedges and ditches in his front, while his flanks were defended on one side by a mountain, and the other by a morass. On the declivity of the hill the van was posted, under the command of the earl of Warwick; the rear was conducted under the earls of Salisbury and Suffolk; and the prince of Wales took his station at the end of the lane, to command the main body, which extended itself into a vineyard. John de Greilly, Capital de Buche, was detached with 300 men at arms, and as many archers, to form an ambush under cover of the trees, bushes, and broken ground, at the foot of the mountain, that he might fall upon the enemy's back in the heat of the action: and the open part of the ground, on which the English stood, was enclosed by the waggons of the army. About nine of the clock in the morning, the chosen body of men at arms, entered the lane with great resolution; but they were so galled by the English archers that lined the hedges, through which they passed, that one half of them fell before they reached the front of Edward's main body, where they were cut in pieces by the lord Audeley. The marshals Clermont and Andrehan, advancing close behind those men at arms, were greatly embarrassed by the horses and bodies of the slain, which choked up the passage, while the archers plied them without intermission. When they penetrated to the van of the English, they met with a very warm reception from the Earl of Warwick; and Salisbury and Suffolk, advancing from the rear, completed their confusion. Clermont was killed upon the spot, and Andrehan felled to the ground by the lord Audeley, who took him prisoner. The fate of these noblemen, and the slaughter that ensued, disconcerted their followers so much, that they fell into disorder, and fled with great precipitation. The first body of the French being thus routed, the dauphin advanced to the charge, though his men were already dispirited; but they had no sooner begun the attack, than John de Greilly, rushing from his ambush, fell upon their rear

with such fury, that they were immediately seized with consternation, and betook themselves to flight. Those noblemen who were particularly entrusted with the care of the dauphin's person, conveyed him from the field to Chavigny, under a guard of eight hundred lances; and the duke of Orleans, with the greatest part of his command, which had not yet engaged, thought proper to follow the same route. The prince of Wales seeing those two bodies broken and routed, immediately mounted his horse, and advanced at the head of his men at arms, to attack the third division, commanded by John himself, who waited for him without flinching. Notwithstanding the impetuosity with which Edward began the charge, the battle was a long time maintained with equal valour on both sides, and dubious success, till Gaucher de Brienne, duke of Athenes, and constable of France, was slain: then his brigade gave way, and victory declared in favour of the English. The prince of Wales falling in among the German cavalry, routed them at the first onset, in which the count of Sarbruck was slain, and the count of Nassau taken prisoner. John, king of France, attended by his son Philip, endeavoured to rally his troops, and animate them by his own example. He fought on foot with uncommon valour, until he was deserted by all his followers; and Dennis de Morhec, a knight of Artois, who had formerly been in his service, exhorting him to surrender without further opposition, he desired to see his cousin the prince of Wales: but as Edward chanced to be in another part of the field, he threw his gauntlet to Morhec, in signal of surrender. Mean while a party of English, and another of Gascons, coming up, deprived him of his royal prisoner, about whom a dispute ensued, which might have been attended with fatal consequences to John and his son Philip, who shared his fate, had not the earl of Warwick and Reginald lord Cobham interposed, and conducted him to prince Edward, who had retired to his pavilion, where he reposed himself after the fatigue of the battle. Upon this occasion, the Black Prince exhibited all the heroism of virtue; he received the king of France with the utmost tenderness and respect; he comforted him under his disaster, by observing that success often depends upon accident; that he had performed the part of a consummate general and undaunted hero; and that he had

fallen into the hands of those who knew how to revere his virtues and misfortune. He expressed the most profound esteem and every warm affection, for the royal family of France, to which he had the honour of being related; and he promised to exert all his influence with his father, to promote an honourable peace, which should be for the advantage of both nations. He even waited upon him at supper, and could not be prevailed upon to sit down, notwithstanding the intreaties of John, who bore his fate with unshaken fortitude; and expressed his satisfaction, that since he was doomed to captivity, he had the good fortune to be the prisoner of the most gallant prince in the universe. The French noblemen, who had been taken in the battle, were struck with astonishment and reverential awe at this instance of generosity and moderation. They looked upon him as a being of some superior species; and while they manifested their veneration for his great qualities, could not help lamenting the fate of their country, which was exposed to the resentment of an enemy endowed with such extraordinary talents. The lord Audeley having signalized his personal prowess above all the noblemen in the field, the prince desired to see him; and he was brought dangerously wounded to his tent, where Edward highly extolled his valour, retained him as his knight, with a grant of 500 marks a year out of his own inheritance; which bounty he forthwith distributed among his four esquires, who had fought by his side in the battle. Edward being informed of this particular, applauded his generosity, confirmed the donation, and settled upon Audeley 600 marks a year out of the coinage of the stanneries of Cornwall. This great victory was gained without the loss of one person of distinction; whereas the French lost the flower of their nobility, who, rather than desert their sovereign, chose to die in his defence. Among those were the count of Damartin, the lords of Rochefoucault, Mathas, La Tour, Montaign, Landas, Charmy, and Ribamont: Guccelard d'Angle was left for dead among the slain, but recovering of his wounds, he entered into the English service, was admitted a knight of the garter, and created earl of Huntingdon. Two dukes, nineteen counts, 5000 men at arms, and about 8000 infantry, are said to have been killed on the French side in this battle. 2000 men at arms were taken prisoners; and among

among these the counts of Ponthieu, Eu, and Tancarville, princes of the blood; the archbishop of Sens, the counts of Estampes and Vaudemont; the lords of Parthenay, Rochecouart, Chaulny, and many other noblemen. The gates of Poitiers being shut upon the fugitives, lest their pursuers should enter the town with them pell mell, such a multitude of prisoners were taken, that the victors dismissed great numbers on parole, at very easy ransoms, which were punctually paid. Every soldier of Edward's army was enriched with the spoils of the enemy, and the ransom of the prisoners, which belonged to the captors, when it did not exceed 10,000 crowns; in which case it was the king's property. Next day prince Edward decamped, and, without undertaking the siege of Poitiers, retired with his prisoners and booty through Saintonge to Bourdeaux; while the dauphin hastening to Paris, assembled the three estates, to concert measures for the defence of the kingdom, and contribute their assistance towards the ransom of their sovereign. Before the states would grant a supply, they took the advantage of their king's distress, to humble the power of the crown: they insisted upon the immediate removal of seven principal officers of state, as well as upon the release of the king of Navarre; they appointed a committee, consisting of twelve prelates, twelve noblemen, and the like number of burgesses, without whose advice the dauphin, who acted as lieutenant of the realm, should take no step in the administration; and they demanded that all the grievances of the nation should be redressed. John being made acquainted with these transactions, desired the dauphin would by no means agree to such insolent demands; for he would rather continue prisoner to an honourable enemy, than return home as a slave to his own subject. As the estates would not relax in their propositions, they were dissolved by the dauphin, who had recourse to the city of Paris for an aid to maintain the war: but the inhabitants, instead of complying with his request, gave him to understand, that they were not obliged to pay any subsidy that was not imposed by the three estates, which they exhorted him to re-assemble. Such answers he received from all the provinces but Champagne and Languedoc, which he found more tractable. Pope Innocent VI. had, upon hearing of John's being carried to Bourdeaux, sent thither the

cardinals of Perigord and St. Nital, to mediate a peace; and though they did not succeed in that part of their negotiation, they obtained Edward's consent to a truce for two years, by sea and land. The duke of Lancaster, who had invested Rennes, was, by an article of this agreement, to raise the siege; but he refused to conform to this article, until the truce should be ratified by the king of England; and in the mean time carried on his operations with such redoubled vigour, that the inhabitants were glad to pay an hundred thousand crowns, to indemnify him for the expence of the siege, and obliged themselves to receive a governor of his own chusing. After the ratification of this truce, prince Edward bought up all the prisoners of distinction from the captors; and setting sail from Guienne on the 24th day of April, with the king of France, and the other prisoners, attended by a large train of English and Gascon noblemen, two hundred men at arms, and two thousand archers, landed on the 5th day of May, at Sandwich. When the tidings of the victory at Poitiers first arrived in England, the king, instead of encouraging revellings and demonstrations of joy, desired that the archbishop of Canterbury would appoint a whole week to be spent in prayer and thanksgiving, that he and the nation might not be too much intoxicated by their success. Notwithstanding this instance of his moderation and self-denial, he now directed the lord-mayor to prepare pageants, processions, and triumphal arches, to honour the public entrance of his victorious son, who was met in Southwark by the mayor and aldermen in their formalities, with one thousand citizens on horseback. The royal prisoner rode through the streets of London in a magnificent habit, mounted on a fine white courser, and attended by the prince of Wales, on a little black horse, with ordinary trappings. The inhabitants vied with each other in displaying plate, tapestry, furniture, and arms offensive and defensive, in their shops, windows, and balconies. The streets were lined with an infinite concourse of people; and the cavalcade lasted from three in the morning till noon, when they reached Westminster-hall, where the king of England sat upon a royal throne, in expectation of their coming. He rose up when John approached, and received him with all that courteous civility which might have been expected from a prince of his character. Then

Then he embraced his son with great tenderness, and told him that the victory did not please him so much, as the modesty with which he had bore his good fortune. As for the captive king, he was entertained in the most sumptuous manner, and provided with an apartment in the king's palace, until the Savoy could be fitted up for his reception.

POISON-WEED, *Toxicodendron*, in botany. See *Toxicodendron*.

POLACRE, among seamen, a ship which, contrary to the common method, has cast off her masts, formed of one piece of timber for the whole length, and without the addition of top-masts. Some polacres are fitted with two masts, but in general they have three; and are also distinguished by a prow, formed in a manner quite different to those of other ships. See *Prova*.

*** POLAND**, a large kingdom of Europe; bounded on the West by the Baltick Sea, Brandenburg, and Silesia; on the South by Hungary, Transilvania, and Moldavia; and on the North and East by the dominions of Russia. It is divided into three large parts, Great Poland, Little Poland, and the duchy of Lithuania; each of which is again divided into palatinates, or provinces. The government of Poland is monarchical and aristocratical, and is at present the only kingdom in Europe which is elective. The king is chosen by a general diet, called together by the archbishop of Gnesna, who is the chief of the republic during the inter-regnum. This diet is held in the open field, in a large hall erected for that purpose, above a mile from Warsaw. When the king is elected, he is obliged to take an oath, that he will maintain the privileges of the republic, called the *Pacta Conventa*. After his coronation, he may dispose of the vacant benefices, and the offices both civil and military. He has a settled revenue of 240,000 a year, and cannot, by his own authority, raise any new taxes, or change any law. The aristocracy of this republic consists in the senate and general diet. The senate is composed of the bishops, great officers, palatines, and governors of towns, who, with the king, regulate the affairs of the kingdom. The general diets, which are assemblies of all the nobility, ought to be held every two years; but they meet oftener upon important occasions. Before a general diet is held, the king sends circular letters to the palatines, declaring what the affairs

are on which the assemblies are to deliberate. Upon this there is a particular diet in every palatinate, wherein nothing can be determined without a general consent; for if one gentleman opposes the opinion of the assembly, it is obliged to break up; and that palatinate from this time, can have no voice in the general diet. There likewise they must be all unanimous; for one senator, or nuncio, can stop the proceedings of the whole. The Poles are large, well made, and robust, and the nobility kind to strangers. The burghers, or citizens, can have no estates but houses in the towns, and little land for about three miles round them. The peasants are poor, miserable, and clownish; and as they possess nothing, they contribute nothing to the support of the government. They are slaves to the gentlemen, who treat them as they please. It is not said they have so much a year, but that they have so many peasants. To the north, the air is generally cold, and they have but little wood: however, it is so fertile in corn in many places, that it supplies Sweden and Holland with large quantities. There are extensive pastures, and they have a large quantity of leather, furs, hemp, flax, salt-petre, honey, and wax. There are so many bees, especially in Lithuania, that their common drink is mead, or metheglin. They have mines of salt, which are a great depth, out of which they dig rock-salt. The prevailing religion is the Roman Catholic, which the king must always profess: however, there are Lutherans, Calvinists, and a great many Jews. There are three universities, at Cracow, Vilna, and Koningberg; two archbishopricks, and fifteen bishopricks. The principal rivers are the Nieper, the Vistula, the Bug, the Niemen, the Niester, and the Bog. Cracow is the capital town, but the king generally resides at Warsaw.

POLAR, in general, something relating to the poles of the world, or poles of the artificial globes: thus we meet with polar circles, polar dial, polar projection, &c.

POLARITY, the quality of a thing considered as having poles; but chiefly used in speaking of the magnet.

POLE, *πολος*, in astronomy, one of the extremities of the axis on which the sphere revolves.

These two points, each 90° distant from the equinoctial or equator, are by way of eminence called the poles of the world; and the extremities of the axes

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of the artificial globes corresponding to these points in the heavens are termed the poles thereof.

POLES, in spherics, a point equally distant from every part of the circumference of a great circle of the sphere, as the center is in a plane figure; or it is a point 90° distant from the plane of a circle, and in a line, called the axis, passing perpendicularly through the center. The zenith and nadir are the poles of the horizon; and the poles of the equator are the same with those of the sphere.

POLES of the Ecliptic, are two points on the surface of the sphere, $23^\circ 30'$ distant from the poles of the world, and 90° distant from every part of the ecliptic.

POLES, in magnetics, are two points of a loadstone, corresponding to the poles of the world; the one pointing to the north, the other to the south. See the article *Magnet*.

POLE, or **VERTEX of a Glass**, in optics, is the thickest part of the convex, or the thinnest of a concave-glass. If the glass be truly ground, the pole will be exactly in the middle of its surface.

POLE, **PERCH**, or **ROD**, in surveying, is a measure containing sixteen feet and a half.

POLE, or **POLAR-STAR**, is a star of the second magnitude, the last in the tail of *ursa minor*.

The nearness of this star to the pole, whence it happens that it never sets, renders it of vast service in navigation, &c. for determining the meridian line, the elevation of the pole, and, consequently, the latitude of the place, &c.

POLEMICAL, in matters of literature, an appellation given to books of controversy, especially those in divinity.

POLIANTHES, in botany, a genus of plants.

POLISHER, or **BURNISHER**, among mechanics, an instrument for polishing and burnishing things proper to take a polish.

POLISHING, in general, the operation of giving a gloss or lustre to certain substances, as metals, glass, marble, &c.

POLITICAL, in general, something relating to policy of government.

POLITICAL Arithmetic, the application of Arithmetical calculations to political subjects, as the public revenues, number of people, extent and value of

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lands; taxes, trade, manufactures, &c. of any commonwealth.

POLITICS, the first part of œconomy, consisting in the well governing and regulating the affairs of a state, for the maintenance of the public safety, order, tranquillity, and morals.

POLITY, or **POLICY**, denotes the peculiar form and constitution of the government of any state or nation; or the laws, orders, and regulations, relating thereto.

POLL, a word used in ancient writings for the head: hence to poll, is either to vote or to enter down the names of those persons who give in their votes at an election.

POLL-MONEY, a capitation or tax imposed by the authority of parliament on the head or person either of all indifferently, or according to some known mark of distinction.

POLLARD, among hunters, a stag which has cast his horns.

POLLUX, in astronomy, a fixed star of the second magnitude in the constellation of Gemini, or the Twins. Its longitude is $19^\circ. 56'. 29''$ of φ , and its latitude $6^\circ. 39'. 27''$ N.

POLYADELPHIA, In botany, a class of plants, the eighteenth in order, whose stamina are connected together at their bases into several serieses. The plants of this class are subdivided into orders according to the number of their stamina: thus the polyadelphia pentandria contain five stamina: and the polyadelphia icosaandria and polyandria contain twenty or more stamina.

POLYANDRIA, in botany, a class of plants, the thirteenth in order, with hermaphrodite-flowers, and a large number of stamina, or male parts in each; these always exceed the number of twelve, and grow on the receptacle of the future seeds. The genera of this class being numerous, are arranged under different orders; the first of which is called polyandria monogynia, as containing only one style; the second, polyandria digynia, as having two styles; and so of the polyandria trigynia, tetragynia, pentagynia, &c. from their containing three, four, five, &c. styles.

POLYANTHUS, in botany, a beautiful garden flower of the primrose kind; the varieties of which are innumerable, being produced from seeds, which should be sown in February, either in borders, boxes, or pots, and should have an east aspect,

aspect, so as to be shaded from the heat of the day; in May they will be fit to be planted out for good, which should be in a shady border of strong rich earth, at about six inches asunder, and the succeeding spring they will shew their blossoms, when their goodness may be judged of.

POLYCHREST, in pharmacy, a medicine that serves for many uses, or that cures many diseases.

Sal **POLYCHREST**, a compound salt made of equal parts of salt-petre and sulphur, laid on a red-hot crucible.

POLYGAMIA, in botany, a class of plants, the twenty-third in order, the characters of which are, that they have flowers of different structure; some having male-flowers, others female ones, and others hermaphrodite.

POLYGAMY, a plurality of wives or husbands, in the possession of one man or woman, at the same time.

POLYGLOTT, among divines and critics, chiefly denotes a bible printed in several languages. In these editions of the Holy Scriptures, the text in each language is ranged in opposite columns. The first polyglott bible was that of cardinal Ximenes printed in 1517, which contains the Hebrew text, The Chaldee paraphrase on the Pentateuch, the Greek version of the LXX. and the ancient Latin version. After this, there were many others, as the bible of Justiniani, bishop of Nebio, in Hebrew, Chaldee, Greek, Latin, and Arabic; the psalter by John Potken, in Hebrew, Greek, Ethiopic, and Latin; Plantin's polyglott bible, in Hebrew, Chaldee, Greek, and Latin, with the Syriac version of the New Testament; M. le Jay's bible in Hebrew, Samaritan, Chaldee, Greek, Syriac, Latin, and Arabic; Walton's polyglott, which is a new edition of Le Jay's polyglott, more correct, extensive, and perfect, with several new Oriental versions, and a large collection of various readings, &c.

POLYGON, in geometry, a figure whose perimeter consists of more than four sides and angles.

If the sides and angles be equal, the figure is called a regular polygon. Polygons of five sides are called pentagons; of six, hexagons; of seven, heptagons; of eight, octagons, &c.

POLYGON, in fortification, denotes the figure of a town, or other fortress.

POLYGONAL Numbers, in algebra, such as arise from a continual addition of

a rank of numbers in arithmetical progression, beginning from unity; so called by reason the units of which it consists may be disposed in such a manner as to represent the figure of several equal sides and angles.

Polygonal numbers are divided, with respect to the number of their terms, into, triangular, which are those whose number of terms is 1; quadrangular or square, where it is 2; pentagonal, where 3; hexagonal, where 4; heptagonal, where 5; octagonal, where 6, &c.

The genesis of the several kinds of polygonal numbers from the several arithmetical progressions, may be conceived from the following examples:

Arith. progres.	1.	2.	3.	4.	5.	6.	7.
Triang. numb.	1.	3.	6.	10.	15.	21.	28.
Arith. progres.	1.	4.	5.	7.	9.	11.	13.
Square numb.	1.	4.	9.	16.	25.	36.	49.
Arith. progres.	1.	†.	7.	10.	13.	16.	19.
Pentag. numb.	1.	5.	12.	22.	35.	51.	70.
Arith. progres.	1.	5.	9.	13.	17.	21.	25.
Hexag. numb.	1.	6.	15.	28.	45.	66.	91.

Polygonal numbers may be thus generally represented. Let d be the common difference of the terms in any arithmetical progression, beginning with an unit, and call the number of terms n ; then will $1, 2 + d, 3 + 2d, 4 + 3d, 5 + 4d, 6 + 5d, \&c.$ to n terms be the polygonal number corresponding to the proposed arithmetical progression.

Side of a **POLYGONAL** Number is the number of terms of the arithmetical progression that compose it; and the number of angles is that which shews how many angles that figure has, whence the polygonal number takes its name.

The number of angles, therefore, in triangular numbers, is 3, in tetragonal 4, in pentagonal 5, &c. consequently the number of angles exceeds the common difference of terms by two.

POLYGONATUM, Solomon's seal, in botany, is ranked by Linnæus among the convallaria.

The root of this plant is a famous vulnerary; for being applied in form of a poultice, it not only heals fresh wounds, but takes away the marks of bruises, &c.

POLYGONUM, knot-grass, in botany. An infusion of this plant is a valuable astringent medicine in hæmorrhages of all kinds.

POLYGYNIA, among botanists, denotes an order or subdivision of a class of plants;

plants: comprehending such plants of that class, as have a great number of pistils, or female organs of generation.

POLYHEDRON, in geometry, a body comprised under many rectilinear sides or planes.

If the sides of a polyhedron be regular polygons, all similar and equal, it becomes a regular body, and may be inscribed in a sphere. See *Sphere*.

* **POLYHYMNIA**, in pagan mythology, one of the nine Muses. She presided over history, or rather rhetoric, and is usually represented with a crown of pearls and a white robe; her right hand in action, as if haranguing, and in her left she holds a caduceus or sceptre, to shew her power.

POLYPE, or **POLYPUS**, in zoology, a small fresh-water insect, of a cylindric figure, but variable, with very long tentacula.

There is scarce an animal in the world more difficult to describe than this surprising insect; it varies its whole figure, at pleasure, and is frequently found beset with young in such a manner as to appear ramose and divaricated; these young ones adhering to it in such a manner as to appear parts of its body.

The production of its young is different from the common course of nature in other animals; for the young one issues from the side of its parent in the form of a small pimple, which lengthening every hour, becomes, in about two days, a perfect animal, and drops from off its parent to shift for itself; but before it does this, it has often another growing from its side; and sometimes a third from it, even before the first is separated from its parent; and what is very extraordinary is, that there has never yet been discovered among them any distinction of sex, or appearance of copulation; every individual of the whole species being prolific, and that as much if kept separate, as if suffered to live among others. But what is even still more surprising, is the reproduction of its several parts when cut off; for when cut into a number of separate pieces, it becomes in a day or two so many distinct and separate animals; each piece having the property of producing a head and tail, and the other organs necessary for life, and all the animal functions. There are several other species of this animal, most of which are found in our ditches.

POLYPODY, *Polypodium*, in botany, a plant which grows in the clefts of old

walls, rocks, and decayed trees: that produced on the oak has been generally accounted the best, though not sensibly different from the others. It is found green at all seasons of the year.

The leaves of polypody have a weak ungrateful smell, and a nauseous sweet taste, leaving a kind of roughness and slight acrimony in the mouth. This root is supposed to be aperient, resolvent, and expectorant: it was formerly ranked among the purgatives, but operates so weakly, a decoction of an ounce or two scarcely moving the belly, that it has long been expunged from that class: the present practice pay very little regard to it in any intention.

POLYPUS, or **POLYPUS** of the Heart, in medicine, a mass composed of various pellicles and fibres generated in the heart and large vessels.

Polypuses are generally found in acute as well as chronic diseases. Their principal seat is in the heart, pulmonary artery, and the aorta. They chiefly attack the sanguine constitutions, and such as have small vessels and soft fibres, those who are of a sedentary life, who drink little, or are free in the use of acid wines and spirituous liquors, or who eat great suppers.

The beginning of a polypus may be known by a compression of the breast, a fixed pain about the heart; and when it increases, there is a frequent palpitation of the heart, from very slight causes; the pulse is strangely unequal, and often intermits; on a violent motion of the body, or the patients taking a medicine which disturbs the blood, or on the mind being violently affected, there arises a shortness of breath, and an incredible anxiety of the heart. Lastly, there are frequent faintings, without any evident cause, or only from a certain position of the body; and if the blood is let fall into hot water, it will congeal like jelly, and cleave into white filaments.

A polypus frequently produces the most dreadful diseases, and even sudden death. In the cure, an exact regimen and diet must be made use of, with frequent exercise, and motions of the body. Etmuller says, that when it proceeds from the scurvy, or hysteric affection, it is curable; and that the cure is to be attempted with chalybeate and coralline medicines, with cinnabar, volatiles, preparations of amber, and all antispasmodics.

POLYPUSES of the Lungs are viscous
excre-

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excretions of the small glands, formed in the deeper branches of the aspera arteria, and frequently mistaken for pieces of the blood-vessels or lungs.

POLYPUS *of the Nose*, a fleshy excrecence, in the inside of the nostrils, which is of various sizes, and of different consistencies; sometimes these excrecences are soft, sometimes they are capable of elongation, and at other times they turn hard and rigid.

POLYSPERMOUS, among botanists, such plants as have more seeds than four succeeding each flower, without any certain order.

POLYSYLLABLE, in grammar, a word consisting of more syllables than three; for when a word consists of one, two, or three syllables, it is called a monosyllable, dissyllable, and trissyllable.

POLYSYNDETON, in grammar and rhetoric, a figure whereby a redundancy of conjunctions, especially copulative ones, is used.

POLYTHEISM, in matters of religion, the doctrine or belief of a plurality of gods.

POLYXENA, in fabulous history, the daughter of king Priam, who bestowed her in marriage to Achilles; but when he entered the temple of Apollo to perform the nuptial rites, he was treacherously slain by Paris. After the sack of Troy the ghost of Achilles appeared, and demanded that Polyxena should be sacrificed on his tomb, which was accordingly performed.

POMATUM, an ointment made thus: take of fresh hog's lard, and beat it into cream with rose water, and scent it with oil of lemons, thyme, or the like. Pomatums are also occasionally perfumed with the odours of jessamines, oranges, jonquils, tuberoses, &c. They are used for pimples and foulnesses of the skin. Also for dressing the hair, &c.

POMEGRANATE, *Malus Punica*, in botany, a prickly tree or shrub; with long narrow leaves; deep red pentapetalous flowers set in bell shaped cups of the same colour; producing fruit about the size of an orange, which consists of a thick tough rind, externally brownish and internally yellow, with a juicy pulp and numerous seeds in cells like a honeycomb. It is a native of the southern parts of Europe, and seldom brings its fruits to full perfection in this climate.

POMME, or **POMMETTE**, in heraldry, is a cross with one or more balls or knobs at each of the ends.

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POMMEL, or **PUMMEL**, in the manège, a piece of brass, or other matter, at the top and in the middle of the saddle-bow.

POMMEL is also a round ball of silver, steel, or the like, fixed at the end of the guard, or grasp of a sword, to serve, in some measure, as a counterpoise.

POMPION, in botany. See *Cucurbita*.

PONIARD, a little pointed dagger, very sharp-edged; it is now little used, except among assassins and at the theatres.

PONTIFEX, **PONTIF**, or **HIGH-PRIEST**, one who has the superintendence and direction of divine worship, as the offering of sacrifices and other religious solemnities. The Romans had a college of pontiffs, and over these a sovereign pontif, or *pontifex maximus*, instituted by Numa, whose function it was to prescribe the ceremonies each god was to be worshipped withal, compose the rituals, direct the vestals, and for a long while to perform the business of augury, till, on some superstitious occasion, he was prohibited intermeddling therewith. The office of the college of pontiffs was to assist the high-priest in giving judgment in all causes relating to religion, inquiring into the lives and manners of the inferior priests, and punishing them, if they saw occasion, &c. The Jews too had their pontiffs; and among the Romanists, the pope is still styled the sovereign pontif.

PONTIFICATE is used for the state or dignity of a pontif, or high-priest; but more particularly, in modern writers, for the reign of a pope.

PONTON, or **PONTOON**, in war, denotes a little floating bridge made of boats and planks. The ponton is a machine consisting of two vessels, at a little distance, joined by beams, with planks laid across for the passage of the cavalry, the cannon, infantry, &c. over a river, or an arm of the sea, &c. The late invented ponton is of copper furnished with an anchor, &c. to fix it. To make a bridge, several of these are disposed two yards asunder, with beams across them; and over those are put boards or planks. They are also linked on each other and fastened on each side the river by a rope run through a ring in each of their heads, and fixed to a tree or stake on either shore: the whole makes one firm uniform

form bridge, over which a train of artillery may pass.

POOL, is properly a reservoir of water supplied with springs, and discharging the overplus by sluices, defenders, weirs, and other caufeways.

Mill Pool, a flock of water by whose force, &c. the motion of a mill is effected.

POOP, the aftmoft or hindmoft deck of a fhip. See *Deck*.

POOR, in law, an appellation given to all persons who are in fo low and mean a condition as that they either are, or may become, a burden to a parish.

Hence under the term poor, may be included thofe who are fo through impotency; as the aged, the blind, the lame, the fatherlefs and motherlefs, persons labouring under ficknefs, or who are idiots, lunatics, &c. for all whom the overseers of the poor are obliged to provide.

There is alfo another kind of poor, on account of casualties and misfortunes; as decayed house-keepers, and thofe who have been ruined either by fire, water, robbery, or losses in trade, &c. all of whom, being able, are to be fet to work, and otherwise relieved by the parish; and it is the fame with respect to poor persons over-charged with children, disabled labourers, &c. As for vagabonds, strumpets, and other thriftlefs sorts of poor, they may and ought to be sent to houses of correction, and put to hard labour, whereby they may be maintained: yet if even these fall sick there, or their work is not fufficient to maintain them, there must be an allowance by the overseers for their support.

Before the reign of queen Elizabeth we had few or no laws for the relief of the poor of this kingdom: but then a statute was made, enacting, that the churchwardens of every parish, and two or more householders, are to be nominated and appointed yearly in Easter week by two justices of the peace, as overseers of the poor; which said overseers shall meet once a month at the parish church, there to confider of proper ways to relieve the poor, &c. And with the assent of the justices they may make a rate on every inhabitant of the parish, and occupier of lands, houses, tithes, as alfo personal estate, to raise a stock for employing of the poor, relieving the impotent, and others not able to work; the placing poor children out apprentices, and erecting cottages for poor persons, &c. The

overseers are likewise to give a true account to two justices within four days after the end of the year, or forfeit twenty shillings, and where these officers are not appointed, the justices incur five pounds penalty, 43 Eliz. c. 2. By this statute the father or grandfather, and mother or grandmother, or even children of poor impotent persons, where they are of ability, are obliged to relieve such poor, according to such rates as justices of peace in their sessions shall appoint, under a penalty of twenty shillings a month for every failure therein.

It has been adjudged that a grandfather, or father-in-law, that is married to the grand-mother, or mother, is within this statute; and if the father of any children leaves the parish, and there is a grandfather to be found, in case he is able to do it, it is said he shall be chargeable with the keeping of the children, and not the parish where they are.

By a late act, the churchwardens and overseers of the poor, where a wife or child is left upon a parish, by persons who have estates or effects which might maintain them, on a warrant of two justices, may seize the goods and receive the rents of the husband or father, in order to support such wife or child, 5 Geo. 1, c. 8.

Every parish is generally to keep and maintain its own poor; and in case any poor persons demand relief, that are not parishioners, they ought to be removed to their proper parishes, and there be relieved; for that parish the poor were last legally settled at, is deemed the place that shall provide for them. And where persons are removed by warrant or order of justices of peace, they shall be received by the churchwardens and overseers whither sent, on pain of forfeiting five pounds to the poor of the parish whence conveyed, to be levied by distress and sale of goods, &c. Nevertheless a sick person should not be sent out of the parish where he is, so as farther to endanger his health; in which case, if the justices grant a warrant to remove him, it will be a misdemeanor in such justices.

As to the settlement, which entitles poor persons to relief, it is acquired several ways, viz. on account of birth, in the case of bastards, vagrants, &c. by continuance for forty days in a parish, after public notice given to overseers, &c. or coming into a parish and renting ten pounds a year estate, or executing any public annual office, paying a shave

to the parish taxes, &c. Also servants acquire this title by serving a year in any parish; and persons bound apprentices: and though a person be only a lodger, it is held that his servant may gain a settlement by serving a year in any parish.

The wife of a person is to be sent to, and settled with her husband, even tho' he should be only a servant; and as generally all children are to their parents. It is however provided, that poor persons shall have the liberty to go to any parish, by virtue of a certificate from churchwardens and overseers, attested by two witnesses, and subscribed by two justices of the peace, owning them to be parishioners; and likewise agreeing, when they become chargeable, to receive them again.

It is also ordained, that there shall be kept in every parish a book, wherein the names of all such persons as receive any relief shall be registered, with the occasion thereof; and the parishioners are once a-year, or oftener, to have a meeting for that purpose, when the said list shall be examined into, by calling over the persons, and enquiring into the reasons why they are relieved; and at this time a new list must be made of those thought fit to be allowed to receive collection; and the persons thus receiving relief ought to wear badges on their right shoulders, also no others shall have any benefit, unless by order under the hand of one justice, &c. 3 and 4 W. and M. c. 11. And no justice of peace shall make any such order in behalf of any poor person, till oath is made of reasonable cause for it, and that he was refused to be relieved by the overseers, &c. And such person shall be registered in the parish-books as other poor; nor may churchwardens and overseers bring to the parish account any money given to poor persons, except on sudden and emergent occasions, who are not registered, on pain of five pounds. The churchwardens and overseers of parishes are empowered to purchase or hire houses, and contract with persons to maintain the poor, &c. who refusing to be so kept, shall be struck out of the parish-books, &c. 9 Geo. I. cap. 7. See 3 Geo. II. cap. 29. By the 13th of Geo. III. such poor as are born in public lying-in hospitals, do not gain a settlement in the parish where such hospital is situate, but are parishioners where their mother is a parishioner.

* POPE, (ALEXANDER) a celebrated poet, and one of the finest writers

England has produced, was born at London, where his father was then a considerable merchant, on the 8th of June 1688. His aunt taught him to read, and he learned to write without any assistance, by copying printed books. The family being of the Romish religion, he was at eight years of age instructed by one Taverner, a priest, who taught him the rudiments of the Latin and Greek tongues together; after which he was sent to, a popish seminary near Winchester, and thence was removed to a school at Hyde-park-corner. He very early discovered a talent for poetry. At twelve, he retired with his parents to Binfield, in Windsor Forest, where he became acquainted with the works of Spencer, Waller, and Dryden; and at that early age composed an elegant small poem. At fourteen he wrote his *Acis and Galatea*, and at fifteen had acquired a readiness in the learned languages. He had already wrote several pieces of poetry, some of which he afterwards burnt. The poet, speaking of his first season of life, says, "I confess there was a time when I was in love with myself, and my first productions were the children of self-love begat upon innocence. I had made an epic poem and panegyrics on all the princes, and I thought myself the greatest genius that ever was. I cannot but regret these delightful visions of my childhood, which, like the fine colours we see, when our eyes are shut, are vanished for ever." At sixteen he published his *Pastorals*, which procured him the honour of being admitted to the conversation and friendship of the earl of Halifax, lord Landford, and other eminent persons; and the same year, 1704, he wrote the first part of his *Windsor Forest*. In 1708, when he was not twenty years of age, he wrote the *Essay on Criticism*, esteemed a master-piece in its kind. Here he shewed that he excelled in didactic poetry, for which he was particularly formed; a clear head, strong sense, and sound judgment, being his characteristic qualities; in 1712, when the *Rape of the Lock* was first completely published, he shewed that he was equally worthy of admiration for being possessed of that creative power of the imagination, which is the distinguishing excellence of a great poet. In 1713 he published proposals for a translation of Homer's *Iliad*, in which all parties so heartily concurred, that a subscription amounted to 6000 l. and Lincolnton the bookseller gave him 1200 l. for the

the copy. Mr. Pope now enjoying a state of great affluence, purchased a house at Twickenham, to which he removed in 1715, with his father and mother, shewing, upon all occasions, the most extraordinary filial affection. As from his religion he adhered to the cause of king James, he made it a point of conscience not to lend his money to the government; and therefore lived upon the capital, which he improved to the utmost. In 1717, he published a collection of those works which he had printed separately; and four years after published a new edition of Shakespeare's plays, in which he shewed that he had consulted his for one more than his fame. The Iliad being now finished, he engaged upon the same footing to undertake the Odyssey, of which Mr. Broome and Mr. Fenton did a part; and for their labour received 500 l. from Mr. Pope. This work was finished in 1725, and he was afterwards engaged with Swift and Arbuthnot in printing some volumes of miscellanies. About this time he narrowly escaped losing his life. He was returning home in a friend's chariot, which, on passing a bridge, was overturned, and fell, with the horses, into the river. The glasses were up, and he was unable to break them, so that he must have been drowned, had not the driver broke them, and dragged him out to the bank: however, he was so cut by a piece of glass that ever after he had not the use of two of his fingers. Pope had been long attacked by many writers, some of whom meanly stooped to ridicule the deformity of his person. However, he had, at the same time, the honour of having his cause espoused by many of the best writers in the nation; and he himself lashed his enemies in his *Dunciad*, which was published with notes by Dr. Arbuthnot, under the name of Scriblerus. He then turned his pen to moral subjects, and wrote his *Essay on Man*, which was followed by his *Ethic Epistles*, and the letters which passed between him and his friends. "If we may judge of him by his works, says the earl of Orrery, his chief aim was to be esteemed a man of virtue. His letters are written in that style; his last volumes are all of the moral kind; he has avoided trifles, and consequently has escaped that rock which has proved very injurious to Swift's reputation. He has given his imagination full scope, and yet has preserved a perpetual guard upon his conduct. The constitution of his body and mind might really incline him to the

habits of caution and reserve. The treatment which he met with from an innumerable tribe of adversaries, confirmed this habit, and made him slower than the dean in pronouncing his judgment upon persons and things. His prose writings are little less harmonious than his verse; and his voice in common conversation was so naturally musical, that I remember honest Tom Southern used to call him the little nightingale. His manners were delicate, easy, and engaging; and he treated his friends with a politeness that charmed, and a generosity that was much to his honour. Every guest was made happy within his doors, pleasure dwelt under his roof, and elegance presided at his table." Mr. Pope had always been subject to the head-ach, which at length was greatly increased by a dropy in his breast, under which he expired the 30th of May 1744, in the fifty-sixth year of his age.

• POPE (Territories of the) in Italy, commonly called the territories of the church, the pope being lord both in spirituals and temporals. It is about 400 miles in length, on the coast of the Adriatic sea, from the kingdom of Naples to the territory of Venice. It is in breadth from north to south not above eighty miles, which is from the gulph of Venice to the Tuscan sea. The subjects of the pope are like the rest of the Italians; but, as the pope styles himself the vicar of Christ, it might reasonably be supposed that his subjects should be the happiest people in the world; but the case is directly contrary, for the government is so absolute, and so severe, that after they have paid all their taxes, they have hardly sufficient remaining to live upon. The pope engrosses all the corn in the country, paying but half the value of it; but when it is sold to the poor people, an extravagant price is always required. Even the bakers are obliged to buy their corn out of the Pope's magazines, and have less measure than what it was bought in by. The pope's territories are divided into twelve provinces, which are separated by the Apennine mountains, some being to the east, some to the west of them; their names are as follow, the *Campagna di Roma*, the *Provincia del Patrimonio*, the duchy of *Castro*, the province of *Orvieto*, the *Perugino*, the duchy of *Spoletto*, the province of *Sabina*, the marquisate of *Ancona*, the duchy of *Urbino*, *Romagna*, or *Romandiola*, the *Bolognese*, and the *Ferrarese*. The

pope is a sovereign prince, and pretends to be the vicar of Jesus Christ upon earth. His ministers of state in church affairs are seventy cardinals, being the number of the seventy disciples of our Saviour. These cardinals elect the pope, which election is determined by the plurality of voices; but he that is chosen must have two thirds of the votes, for fear of a schism. Formerly, when the pope died, the cardinals were liable to be solicited to follow the views of particular persons, which caused the election to be put off for a considerable time, but they have now remedied this inconvenience, and have built a palace for that purpose, called the conclave. Therefore, as soon as the pope is dead, the cardinals are obliged to repair thither immediately, and to continue shut up till they have chosen another. The election of the new pope is immediately followed by his coronation; and this ceremony is performed in the Lateran church, where they put a triple crown on his head. Formerly every cardinal had some hopes of being pope, but for about 200 years past the Italian cardinals have been only in possession of this high dignity. Though the pope may give a cardinal's hat to whom he pleases, yet he is often obliged to pay some regard to the recommendation of crowned heads. The provinces which depend upon the holy see are governed by legates; but, besides the twelve above mentioned, there is one at Avignon in France, and another at Benevento in the kingdom of Naples. There are few popish countries where the pope has not ambassadors, who are called nuncios; there is generally one at Vienna, Paris, Lisbon, Madrid, Warsaw, Switzerland, Venice, Brussels, and Cologne; and these nuncios are cardinals. They have the titles of Legates a Latere. The title given to the pope is his Holiness, and the cardinals have that of Eminence. The datary's office is the chancery of the pope, and the decrees issued from thence are called apostolic briefs. All the ecclesiastics, and all the religious orders who profess the Roman Catholic religion, are under the pope, and every one of these orders has its general at Rome, by whom the pope is acquainted with every thing that passes in the world. As there is scarce a religious house that has not a greater revenue than they spend, and as they are all desirous of supporting the pope's authority, we may conclude he never wants money. It has been computed, that the

common revenue which the pope receives amounts to above one million sterling. However, it is difficult to know what he receives besides this, from the benefices which he confers, the dignities to which he nominates, the first fruits, the dispensations, the indulgencies, the beatifications, &c. There was a time that his holiness had an army of 20,000 men on foot; and there is little doubt to be made that, in case of necessity, he could raise three times that number. He also fits out, from time to time, a few galleys against the Turks. However, at present his forces are not very formidable, either by sea or land. About 600 years ago the pope could raise an army of 100,000 men, under pretence of a war in the Holy Land; but in this enlightened age he would find few willing to engage in such an expedition. The pope has a particular governor of Rome, which is one of the highest and most gainful offices in his disposal. The Roman Catholic religion is the only one allowed throughout the pope's dominions, and yet there are about 10,000 Jews settled at Rome, who are obliged to go every Sunday to hear a sermon on the controverted points; but it does not appear that they make many converts. The inquisition at Rome is called the Holy Office, and it is milder than in other countries. Among the different congregations composed of cardinals, one of the principal is that of De propaganda fide, which has been established to bring about the conversion of pagans and heretics. It has a printing-house belonging to it, where books are printed in all languages; and it is also a school, where missionaries are brought up, and sent into all parts of the world.

POPE, PAPA, the sovereign pontiff, or supreme head of the Romish church. The appellation of pope was anciently given to all Christian bishops, but about the latter end of the eleventh century, in the pontificate of Gregory VII. it was usurped by the bishop of Rome, whose peculiar title it has ever since continued. The spiritual monarchy of Rome sprung up soon after the declension of the Roman empire.

POPPY, *Papaver*, a medicinal annual plant, which flowers from June to near the end of summer.

There are various kinds, some wild, some cultivated; the chief are the white, black, and red poppy.

These plants are found wild, as hath been already observed, in some parts of Europe;

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Europe; and several varieties of them, in regard to the flowers, are produced by culture in our gardens. The heads, stalks, and leaves, have an unpleasant smell, and a bitterish biting taste, of the same kind with those of opium. The collection of the pure milky juice of the poppy has not, among us, been as yet practised in large, or with a view to the supplying of the common demand of opium. Instead of this troublesome process, the college of London directs the dried heads, cut and cleared from the seeds, to be boiled in water, in the proportion of three pounds and a half to six gallons, and now and then stirred to prevent their burning, till only about one third part of the liquor remains, which will be almost entirely soaked up by poppies: the decoction is to be strongly pressed out, boiled down to about four pints, then strained whilst hot, first through a sieve, and afterwards through a fine woollen cloth, and set by for a night to settle: to the liquor poured off clear, six pounds of double refined sugar are to be added, and the mixture boiled till its weight comes to nine pounds or a little more, that it may become a syrup of a proper consistence. An ounce of this syrup is reckoned equivalent to about a grain of opium, being found to have nearly the same soporific power with that quantity of the concrete juice, though it acts in general rather more kindly, and agrees in some cases where opium itself cannot well be borne. See *Opium*.

POPLAR, *Populus*, in botany, a genus of trees. There are different species of this genus, as the white poplar or abele tree, the black poplar, the aspen tree, the Carolina poplar, &c. They are propagated either by layers, or large cuttings, planted in February, in a moist soil, where they will readily take root.

The best use these trees can be applied to, is for breaking off the westerly or northerly winds, and to be planted in such land where scarce any other tree will thrive, for the advantage as will arise from its timber; for the wood of these trees, especially of the abele, is very good to lay for floors, where it will last many years, and for its exceeding whiteness, is by many people preferred to oak; but being of a soft contexture, is very subject to take the impression of any thing hard and pointed, which renders it less proper for this purpose; it is also very proper for wainscoting rooms, being less subject

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to swell or shrink than most other sorts of wood; but for turnery-ware there is no wood equal to this, for its exceeding whiteness; so that trays, bowls, and many other utensils, are made of it; and the bellows-makers prefer it for their use, as do also the shoemakers for heels for womens shoes; and of this wood the shoes are made which are worn by the peasants in France: it is also very good to make light carts; and the poles are very proper to support vines, hops, &c. and the loppings will afford good fuel.

PORCELAIN, or **PURCELAIN**, a fine sort of earthen-ware, chiefly manufactured in China, and thence called China ware. See *China ware*.

PORCELAIN-SHELL, *Porcellana*, in natural history, a genus of shell-fish, with a simple shell without any hinge, formed of one piece, and of a gibbous figure on the back: the mouth is long, narrow, and dentated on each side; and the animal inhabitant is a limax.

PORCH, in architecture, a kind of vestibule supported by columns, much used at the entrance of the ancient temples, halls, churches, &c.

A porch, in the ancient architecture, was a vestibule, or a disposition of insulated columns, usually crowned with a pedement, forming a covert place before the principal door of a temple, or court of justice. Such is that before the door of St. Paul's Covent-Garden, the work of Inigo Jones.

PORCUPINE, *Histrix*, in zoology, a very singular genus of quadrupeds, belonging to the order of the glires. The fore-teeth of the porcupine are obliquely truncated, and it has no canine teeth: its ears are of a figure approaching to round, and the body is covered with prickles, or spines, and also with bristles, like those of a hog. The spines, or quills, as they are commonly called, are two kinds; some being shorter, thicker, stronger, and more sharp-pointed; and others longer, weaker, and more flexible: these last are a foot long, and compressed at the point. The spines of the first kind are white at the base, and of a dusky chestnut colour on the upper part; and the latter kind are white at each extremity, and variegated with black and white in the middle. This terrible covering makes the creature appear much larger than it really is; it somewhat resembles the badger in shape; and its length, from the nose to the tail, is about two feet.

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PORE, in anatomy, a little interspace or space between the parts of the skin, serving for perspiration.

PORPESSE, in ichthyology, a species of the delphinus, with a coniform body, a broad back, and a subacute rostrum; it is a very large fish, frequently confounded with the dolphin, from which it is different.

PORPHYRY, in natural history, a kind of stone of a plain uniform mass, spotted with separate concretions, of great hardness, giving fire with steel, not fermenting with acids, and very slowly and difficultly calcining in a strong fire. Porphyry is of several sorts, as 1. The porphyry of the ancients, which is a most elegant mass of an extremely firm and compact structure, remarkably heavy and of a fine strong purple, variegated more or less with pale red and white; its purple is of all degrees, from the claret-colour to that of the violet, and its variegations are rarely despoiled in veins, but spots, sometimes very small, and at others, running into large blotches. It is less fine than many of the ordinary marbles, but it excels them all in hardness, and is capable of a most elegant polish. It is still found in immense strata in Egypt. 2. The hard red-lead-coloured porphyry, variegated with black, white, and green. This is a most beautiful and valuable substance. It has the hardness, and all the other characters of the Oriental porphyry, and even greatly excels it in brightness, and in the beauty and variegation of its colours. It is found in great plenty in the island of Minorca, and is extremely worth importing, for it is greatly superior to all the Italian marbles. 3. The hard, pale-red porphyry, variegated with black, white, and green. This is of a pale flesh-colour; often approaching to white. It is variegated in blotches from half an inch to an inch broad. It takes a high polish, and emulates all the qualities of the Oriental porphyry. It is found in immense strata in Arabia Petraea, and in the upper Egypt, and in separate nodules in Germany, England and Ireland.

PORRUM, the leek, in botany, agrees with the cepa, or onion, both in botanical characters and medicinal virtues, being only accounted weaker.

PORTA, or **VENA-PORTA**, in anatomy, one of the three primary veins of the human body.

The vena-porta in its structure has some resemblance of a tree; the roots or

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inferior branches of which are divided into the right and left.

PORT, a harbour, river, or haven, either formed by nature or art, to receive and shelter shipping from the storms and waves of the open sea.

Artificial ports are those which are either formed by throwing a strong mound or rampire across the harbour's mouth to some island or rock, or erecting two long barriers, which stretch from the land on each side like arms or the horns of a crescent, and nearly inclose the haven; the former of these are called mole-heads; and the latter piers.

PORTICO, in architecture, a kind of gallery on the ground, supported by columns, where people walk under covert. Though this word is derived from *porta*, a gate or door, yet it is used for any disposition of columns which form a gallery.

PORTION, in law, a part, or proportion, either of money given with a daughter, or of an inheritance.

PORTION, in the canon law, that proportion or allowance which a vicar receives out of a rectory or impropriation.

* **PORTLAND**, a peninsula in the county of Dorset, seated on the English channel, ten miles South of Dorchester. It is very strong both by nature and art, being surrounded by inaccessible rocks, except at the place of landing, where there is a strong castle, built by Henry VIII. It is about seven miles in circumference. On the South side stands the only church in the peninsula, so near the sea, that for its security from the waves, they have been obliged to build the wall of the church-yard to an incredible height. It is chiefly noted for its stone so proper for building, that St. Paul's church in London, and other large structures are built therewith. Long. 2. 48. W. Lat. 50. 30. N. There are frequent wrecks here, upon which occasions the inhabitants behave so ill, that they are called Portland sharks.

PORTMANTEAU, a cloak-bag of cloth, leather, &c. in which the cloak, linen and other habiliments of travellers are disposed and laid on the horse's crupper.

* **PORTO BELLO**, taken. On the 23d day of October 1739, war was declared against Spain, and on the 5th of November admiral Vernon sailed from Jamaica to Porto Bello, with his majesty's ship the Burford of 70 guns, commanded by captain Watson; the Hampton-

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ton-Court of 70 guns, commanded by captain Dent, under commander Brown; the Princess Louisa of 60 guns, commanded by captain Waterhouse; the Worcester of 60 guns, commanded by captain Perry Mayne; the Stafford of 60 guns, commanded by captain Trever; the Norwich of 50 guns, commanded by captain Herbert; and the Sheerness, which he dispatched to cruise off Carthage. It was the 21st of that month before the admiral could bring his ships up in a line of battle to attack the place, which lay at the bottom of a spacious bay, and was defended at the entrance of the harbour by a castle, which from its strength was called the iron castle. From the situation of the place it was absolutely necessary to master that castle, before they could proceed to the town under the fort. It was very strong, had it been tolerably well defended. Commodore Brown in the Hampton-Court, captain Herbert in the Norwich, and captain Mayne in the Worcester, were destined to the attack of it, while the admiral lay behind to observe the effect of their operation. Brown led the attack with great resolution, and being well seconded by the other two ships, the admiral saw the Spaniards, within the forts, give way; upon which he gave the signal for the boats where the soldiers were, to land, and he himself coming up at the same time, by the fire of his small arms drove the Spaniards from the lower batteries, which they chiefly depended upon for their defence; and the other ships not coming so near as he did, having dismantled the upper works of the enemy, the landing of the soldiers was effectuated: and though no breach was made, the lower batteries being left unguarded, and the Spaniards retreating to the higher parts of the fortification, they were thrown into the uttermost consternation. The English sailors, without waiting for any regular capitulation, mounted upon one another's shoulders, upon the lower battery, drew the soldiers after them, and struck the Spanish colours; upon which the few who remained upon the upper battery, hung up a white flag, and surrendered at discretion. The admiral's next attack was upon the Gloria castle, which lay at the bottom of the bay, and covered the town, and which he battered very successfully, with his lower tier of guns, and with very considerable loss. On the 22d the castle hung out a white flag, and sent a flag of

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truce in a boat to the admiral, who drew up the terms upon which he was willing to grant a capitulation. The English becoming thus masters of the town and the fort, found two 20 gun ships and a snow in the harbour; and upon seeing the strength of the place they had taken, they were astonished at their own success. The admiral took on board his ships forty pieces of brass cannon, ten brass field-pieces, four brass mortars, and eighteen brass petararoes; and rendered useless above eighty iron canon. He then blew up the fortifications with their own powder, in which he employed captain Knowles, captain Boscawen, commodore Brown, and captain Watton; and it is remarkable they found more danger and difficulty in demolishing those works, than in taking them. It was greatly to the admiral's honour, that he behaved to the Spaniards who fell into his hands with vast humanity, and was far from making any private advantage of his success, giving his own share to be divided among the common soldiers and sailors. His courage upon this occasion was as remarkable as his humanity, for he exposed himself equally with the meanest sailor or soldier; and the Spaniards having no idea that a ship durst venture into their harbour, when they saw them come within pistol-shot of their walls, were struck with an astonishment that was more serviceable to the English than any superiority of number or force could have been. Upon the whole, the conquest of Porto Bello was the more glorious, as the Spaniards had more men to defend the place than the British admiral could spare hands, to attack it; he having no more than two hundred and forty land soldiers, which were furnished by the government of Jamaica from the independent companies of that island.

PORTS of a Ship, the embrasures or holes through which the cannon are fixed.

Bar-PORT, a port whose entrance is stopped up with a bar, or bank of sand, and can only be entered at high water, as that of Dublin.

Free PORT, in commerce, a port in which merchants of all nations may load and unload their vessels, without paying any duties or customs: as those of Leghorn, Genoa, &c.

PORT is also a strong wine brought from Port-a-port, also called Porto and Oporto.

PORT-CRAYON, a pencil-case, which

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which is usually four or five inches long and contrived so as that the pencil may slide up and down. Its inside is round, and its outside is sometimes filed into eight sides or faces, on which are drawn the sector-lines; sometimes it is made round both without-side and within, and has its length divided into inches and parts of inches.

PORT-GREVE, or PORT GRAVE, was formerly the principal magistrate of maritime towns. The chief magistrate of London was antiently called by this name, till Richard I. caused the city to be governed by two bailiffs, soon after which king John granted the city a mayor.

PORTRAIT, POURTRAIT, or *Peur-traiture*, in painting, the representation of a person, and especially of a face done from the life.

In this sense we use the term *portrait-painting*, in contradistinction to history painting, where a resemblance of person is usually disregarded. Portraits, when as large as the life, are usually painted in oil-colours; sometimes they are painted in miniature with water-colours, crayons, pastels, &c.

* **PORTSMOUTH**, a sea-port town in Hampshire, with two markets, on Thursdays and Saturdays; and one fair, on July 10, for silver-smiths, mercers, cabinet-makers, linen and woollen drapers, milleners, cutlers, shoe-makers, hatters, ready made cloaths, and bedding. It is one of the most secure and capacious harbours in England, being defended by a numerous artillery, both on the sea and land side, and has very good fortifications. A great part of the royal navy is built here; and here are some of the finest docks, yards, and magazines of naval stores, in Europe. It is seated in the isle of Portsey, being surrounded by the sea except on the North side, where there is a river which runs from one arm to the other. It is much resorted to on account of the royal navy, whose rendezvous is at Spithead, which is at the east end of the Isle of Wight, and opposite to Portsmouth. There is a drawbridge over the river, and it has always a good garrison. It is governed by a mayor, twelve aldermen, and burgesses, and sends two members to parliament. It has one church, and two chapels, one in the garrison, and one in the common, for the use of the dock, and others, besides several meeting-houses of the dissenters. The houses of Portsmouth amount to about 1200, and the inhabi-

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tants to about 12,000. The dockyard at Portsmouth was lately burnt down, supposed to be set on fire by some of the enemies of Great Britain, but it is now perfectly repaired. It is 20 miles S. E. of Winchester, 18 S. by W. of Peterfield, and 73 W. of London. Long. 16. W. Lat. 50. 48. N.

* **PORTUGAL**, the most western kingdom of Europe, is about 310 miles in length, and 150 in breadth. It is bounded on the west and south by the ocean, and on the east and north by Spain. Though Spain and Portugal are in the same climate, yet the air of the latter is much more temperate than that of the former, on account of the neighbourhood of the sea. Corn is not very plentiful in this country, the inhabitants not being fond of husbandry: for this reason they import Indian corn from Africa, which is made use of by the peasants instead of wheat. There are a great number of barren mountains, and yet they have plenty of olives, vineyards, oranges, and lemons, nuts, almonds, figs, and raisins. They have some horned cattle, whose flesh is generally lean and dry. They also make a great deal of salt with the sea water, especially in the bay of St. Ubes, from whence a great deal is exported. Their foreign trade consists either in the exportation of the produce of their own country, or in the merchandize they receive from their plantations and settlements in various parts of the world, such as sugar, tobacco, rum, cotton, indigo, hides, Brazil and other woods for dying, many drugs of different sorts, and excellent in their kinds. Besides these, they have gold, silver, diamonds, and other precious stones from America, which bring them in immense riches. Towards the frontiers of Spain there are mountains in which they formerly get gold and silver, and the river Tagus, or Tago, was famous for its gold sands; but now the Portuguese do not think them worth attending to. There are also mines of iron, tin, lead, quarries of marble, and some precious stones. The principal rivers are the Tago, the Duro or Douro, the Guadiana, the Minho, and the Munda or Mondego. Portugal is divided into six provinces, namely, two in the middle, called Estremadura and Beira, two on the north, which are Entre-Minho e-Douro, and Trás-os-Montes; also two on the south called Alentejo and Algarve. The principal merchants are very rich. Learning is upon the decline, and the

academies

academies and schools are gone to decay. The Portuguese women are fruitful, and if they had not sent so many colonies abroad, this country would have been full of people. The government is monarchical, and yet there is a great difference between the sovereignty of the king of Portugal and the king of Spain; for the authority of the pope here is very great. Besides this, the king is always obliged to live in good understanding with the states of the kingdom, which are, the clergy, nobility, and what is called the third state. Likewise, the authority of the king is bounded by the fundamental laws of the kingdom: for he cannot raise any more taxes than were settled in 1674, nor can he appoint a successor when there is any failure in the royal line. It might reasonably be imagined, that the Portuguese should abound in gold, silver, and jewels, but they are naturally indolent, and so fond of luxury in every sense, that they spend all their wealth in the purchase of foreign merchandizes. No other religion is allowed here but the Roman Catholic, and they have three archbishops, and ten bishops, besides a patriarch. They have three severe inquisitions, and yet there are a great number of concealed Jews, even among the grandes of the court. The authority of the pope is so great, that the king cannot confer any benefice without his consent. Besides these, there are three orders of ecclesiastical knights, who enjoy great revenues, and who would be very formidable, if the king was not grand master. In 1580, there was a failure in the royal line, and Philip II. king of Spain, got possession of the crown; but in 1640, there was a great revolution, and John, duke of Braganza, obtained the crown, whose descendants have enjoyed it ever since. Lisbon is the capital city.

PORUS BILARIUS, according to some is the same with the hepatic duct; but others make a distinction between them, and observe, that the ductus hepaticus runs from the liver to the ductus choledochus; and that the branches of this distributed through the whole liver, make what are called the pori bilarii.

POSE, in heraldry, denotes a lion, horse, or other beast standing still with all his four feet on the ground.

POSITION, or **SITUATION**, in physics, an affection of place, which expresses the manner of any body's being therein.

POSITION, in architecture, denotes

the situation of a building with regard to the points of the horizon. Vitruvius directs the position of a building to be such, as that the four corners point directly to the four cardinal winds.

POSITION, *False Position*, or *Rule of Falshood*, in arithmetic, consists in calculating on several false numbers, taken at random, and, from the differences found therein, determining the number sought.

POSITIVE, a term of relation sometimes opposed to negative: hence a positive quantity, in algebra, is a real or affirmative quantity, or a quantity greater than nothing: thus called in opposition to a privative or negative quantity, which is less than nothing, and marked by the sign —. Positive quantities are denoted by the character + prefixed or supposed to be prefixed to them.

POSITIVE DEGREE, in grammar, is the adjective in its simple signification, without any comparison; or it is that termination of the adjective which expresses itself simply, and absolutely, without comparing it with any other.

POSSE Comitatus, in law, signifies the power of the county, or the aid and assistance of all the knights, gentlemen, yeomen, labourers, servants, apprentices, &c. and all others within the county that are above the age of fifteen, except women, ecclesiastical persons, and such as are decrepid and infirm.

POSSESSION, in law, the holding or occupying of any thing, either de jure or de facto.

Possession de jure is the title a man has to enjoy a thing, though it be usurped, and in the actual possession of another; or where lands are descended to a person, and he has not yet entered into them: and possession de facto, or actual possession, is where there is an actual and effectual enjoyment of a thing.

POSSESSIVE, in grammar, a term applied to pronouns which denote the enjoyment or possession of any thing, either in particular or in common; as *meus*, mine, and *tuus*, thine; *noſter*, ours; *veſter*, yours. See *Pronoun*.

POSSIBILITY, *Possibilitas*, in law, is defined to be any thing that is altogether uncertain, or what may or may not be, and is taken to be either near or remote. A near possibility is where an estate is limited to one after another's decease, whilst a remote possibility is something extraordinary that is never likely to come to pass;

POSSIBLE, *Possibilis*, is sometimes opposed to real existence, and understood of a thing which, though it does not actually exist, yet may exist; as a new star, another world, &c. which are particularly said to be physically possible. It is also opposed to impossible, in which sense it is applicable to any thing that does not contradict itself, or involve contradictory predicates, whether it actually exist or not, as a man, fire, &c. these are also said to be logically possible.

POST, a courier or letter-carrier, or one who frequently changes horses, posted or placed on the road, for quicker dispatch. The word is also applied to the houses where such a person takes up and lays down his charge.

Penny-POST, a post established for the benefit of London and the adjacent parts; by which any letter or parcel not exceeding sixteen ounces weight, or ten pounds value, is speedily conveyed to and from all parts within ten miles of London.

POST, in the military art, any place or spot of ground fortified or not, where a body of men may make a stand and fortify themselves, or remain in a condition to fight an enemy. Hence it is said, that the post was relieved, the post was taken sword in hand, &c.

Advanced POST, a spot of ground seized by a party to secure the army, and cover the posts that are behind.

POSTS, in building, large pieces of timber placed upright in houses.

POSTERN, in fortification, a small gate generally made in the angle of the flank of a bastion, or in that of the curtain, or near the orillon, descending into the ditch; by which the garrison may march in and out unperceived by the enemy, either to relieve the works, or to make private sallies, &c.

POSTHUMOUS, a child born after the death of his father, or taken out of the body of a dead mother; from whence it is frequently applied to the works of an author not published till after his decease.

POSTING, among merchants, the putting an account forward from one book to another, particularly from the journal or waste-book to the ledger.

POSTPONING, putting any thing after or behind another, with regard to time.

POSTSCRIPT, an article added to a letter or memoir, containing something learnt or recollected after the piece was written.

POSTULATE, *Postulatum*, in mathematics, &c. is described to be such an easy, and self-evident supposition, as needs no explication or illustration to render it intelligible; as, that a right line may be drawn from one point to another; that a circle may be described on any center given, of any magnitude, &c. However, authors are not well agreed as to the signification of the term postulatum; some make the difference between axioms and postulata to be the same as that between theorems and problems; axioms, according to those authors, being indemonstrable theoretical truths. But others will have it, that axioms are primitive and common to all things, partaking of the nature of quantity, and which therefore may become the objects of mathematical science: such as number, time, extension, weight, motion, &c. and that postulata relate particularly to magnitudes, strictly so called, as to things having local extension, such as lines, surfaces, and solids; so that in this sense of the word postulatum, Euclid, besides axioms, or those principles which are common to all kinds of quantities, has assumed certain postulata to be granted him peculiar to extensive magnitude.

POSTURE, in painting and sculpture, the situation of a figure with regard to the eye, and of the several principal members thereof, with regard to each other, whereby its action is expressed.

POTABLE, *Potabilis*, something that may be swallowed by way of drink.

POT-ASH, the lixivious ashes of certain vegetables, used in the making of glass, soap &c. See *Glass*, *Soap*, &c.

There are two principal sorts of these salts brought chiefly from Germany, pearl-ash and pot-ash. The pearl-ash is either of the whitish pearl colour from which it receives its name, or externally of a bluish cast, which these kinds of salts are apt to receive in calcination from the contact of any inflammable matter. Both the pearl-ashes are tolerably pure alkalies: dissolved in water, or deliquated in the air, they leave only a small quantity of earthy matter, scarcely more than every alkaline salt does upon repeated solutions and calcinations. They are sometimes, however, adulterated with heterogeneous saline matters, particularly sea-salt. The purity of pearl-ash from substances of the earthy kind points out the method in which it has been prepared, namely, evaporating a ley of vegetable ashes till the salt remains dry.

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Pot-ash is a much more impure saline mass : that called Russia or Muscovy pot-ash is accounted the best. This is of a dark colour, considerably hard, and does not easily grow moist in the air : on boiling it in water, a quantity of earth remains undissolved, much larger than that of the salt which is extracted. It is nevertheless found to be strongly alkaline, to be more pungent to the taste, to saturate more acid, and more powerfully to dissolve oils, than the purer alkaline salts : hence it is preferred by the soap-boller.

This salt is said to be prepared, by burning wood with a close smothering heat ; making a ley from the coarser part of the ashes, and moistening therewith the finer part into the consistence of a paste, stratifying this paste with some of the inflammable kinds of wood, and setting the pile on fire. It is not improbable that the saline and earthy part of the ashes would thus run together into hard lumps ; but a mass possessing the activity of Russia pot-ash is not to be obtained by any process of this kind. For the discovery of the ingredient on which that quality depends, we are obliged to Dr. Home, who, in his essay on bleaching, has proved, by a number of curious experiments, that Russia pot-ash contains a large admixture of quick-lime.

POTATOE, in botany, the English name for a species of the tuberosc rooted solanum.

Culture of POTATOES.—The most advantageous way of propagating potatoes is, the planting them at large distances, and digging or horse-hoeing the ground several times between them.

Mr. Tull gives an example of this, in which the hoeing succeeded much better than dung, and without the expence of it. A piece of ground was planted with potatoes, the greater part of it in the common way ; but in one part worse than the rest, they had been set at a yard distance every way. The rest of the ground was dunged ; this poor part had no dung, but was ploughed deep at several times four different ways, so that the ground was stirred and broken thoroughly every where about the potatoes. The consequence was, that though no dung was used here, and though the plants appeared much weaker than in the dung part, yet the crop was greatly better than that of the other part of the field. The roots here were all large, and in the other parts of the field, where the dung had been used without

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ploughing, they were so small, that the crop was scarce worth taking up.

This is one of many instances of the no great use in dunging land, without properly stirring it up, and serves to prove, what the crops of corn, and every thing else confirm upon trial, that the stirring the earth sufficiently, without any farther trouble, will answer better without any other manure, than all the manure in the world without it. *Tull's Horse-hoeing Husbandry.*

POTENT, or POTENCE, in heraldry, a term for a kind of cross, whose ends all terminate like the head of a crutch.

POTENTIAL, in medicine. Cauteries are distinguished into actual and potential. See *Cautery*.

POTENTIAL, in grammar, an epithet applied to one of the moods of verbs. The potential is the same in form with the subjunctive, and is according to Rudiman implied in that mood, for which reason that grammarian rejects it ; but others will have it differ from the subjunctive in this, that it always implies in it either *possum*, *velo*, or *debeo*. It is sometimes called the permissive mood, because it often implies a permission or concession to do a thing.

POTION, *POTIO*, a liquid medicine, consisting of as much as can be drank at one draught. The writers on pharmacy distinguish potions into cathartic, cardiac, and alterative.

POTTERY, the manufacture of earthen-ware, or the art of making earthen vessels.

The wheel and lathe are the chief, and almost the only instruments used in pottery : the first for large works, and the last for small.

POTTLE, an English measure containing two quarts.

POULTICE, or *Poultis*, a form of medicine also called cataplasm.

POULTRY, all kinds of domestic birds brought up in yards, as cocks, hens, capons, ducks, turkeys, &c.

POUNCE, gum sandaric pounded and sifted very fine, to rub on paper, in order to preserve it from sinking, and to make it fit to write upon.

POUND, *Libra*, a standard-weight, for the proportion and subdivisions of which, see the article *Weight*.

POUND also denotes a money of account ; so called, because the ancient pound of silver weighed a pound troy.

PAUND, among lawyers, denotes a place

place of strength, in which to keep cattle that are distrained, or put in for trespass, until they are replevied or redeemed.

POURSUIVANT, or **PURSUIVANT**, in heraldry, a follower, the lowest order of officers at arms.

POURVEYANCE, or **PURVEYANCE**, in law, the providing corn, fuel, victuals, &c. for the king's household; and hence, the officer, who did so, was termed *pourveyor*.

POWDER, *Pulvis*, in pharmacy, a dry medicine well broken, either in a mortar, by grinding, or by chemical operations.

POWER, *Potentia*, in physiology, the faculty of doing or suffering any thing.

Power therefore is two-fold, viz. considered as able to make, or able to receive any change; the former of which may be called active power, and the latter passive power. Of passive power, all sensible things abundantly furnish us with ideas, whose sensible qualities and beings we find to be in a continual flux, and therefore we look on them as liable to the same changes. Nor have we fewer instances of active power; since whatever change is observed, the mind must collect a power somewhere able to effect it; but, especially, by reflecting on the operations of our own minds, as the power of perception, of volition, &c.

Dr. Keil demonstrates that the physical power, or action of bodies, propagated in orbem; as light, heat, odour, &c. has its efficacy increased or diminished in a duplicate ratio of the distances from the center of radiation, or exertion of that power.

POWER, in mechanics, denotes any force, whether of a man, a horse, a spring, the wind, water, &c. which being applied to a machine, tends to produce motion. See *Machine* and *Engine*.

The intensity of a power is its absolute force; that is, its force, supposing its velocity equal to its weight: for its moving or acting force may be greater or less according as its velocity is increased or diminished, in respect of that of the weight. As for example, if a man be the power, and can raise from the ground a certain weight, that weight will express or be equal to the intensity of the power; for in this case, whatever engine be made use of, that part of the engine, where the weight is duly applied, will move just as fast as that on which a man acts with his whole force.

A power may act in any direction what-

ever; but a weight has only one direction; viz. towards the center of the earth. See *Gravitation*.

When we speak of the mechanical powers, the word power is taken in a very different sense from that above laid down; since, in this case, it signifies only an organ or instrument, whereby a power of a known intensity is made to act upon a weight: and therefore we must take care not to attribute any real force to any simple or compound machine, as many are apt to do merely because the name power has been given to mechanical organs, not from their effect, but from the effect which the power produces by their means. For how much soever the force of a power is thereby increased, in order to sustain or raise a weight far superior to it in intensity, yet this cannot be done without losing in space and time what is gained in force; contrary to what some have vainly imagined, because the vulgar commonly speak of a machine as they do of an animal; attributing that effect to the machine, which is only the effect of the power by means of the machine: thus, it is usual to say, such a machine raises such a quantity of water, or performs such and such work; when we should say, if we would speak philosophically, such a running stream; such a fall of water, the wind, or so many men, horses, oxen, &c. raise so much water in such a time, &c. by means of such or such a machine. It were therefore to be wished, that the word power were to be confined to its proper sense, and not used to signify one of the mechanical organs; however, as it has been customary to use it in that sense, we have done so too, but withal thought proper to give the above caution.

The simple mechanical organs or powers are the lever, ballance, axis in peritrochio, pully, screw, wedge, and inclined plane.

POWER, in law, signifies in general, a particular authority, granted by any person to another to represent him, or act in his stead.

POWERS, in arithmetic and algebra, are numbers or quantities arising from the squaring or multiplication of any number or quantity by itself, and then that product by the root or first number given; and this third product by the root again; and so on ad infinitum; as 1, 4, 8, 16, 32, 64, 128, 256, &c. Where 2 is called the root or first power, 4 is its square or second power, 8 its cube or third power,

16 its biquadrate or fourth power, &c. And these powers in letters or species are expressed by repeating the root as often as the index of the power expresses. Thus a is the root or first power; $a a$, the square or second power; $a a a$, the cube; $a a a a$ the biquadrate or fourth power. And to avoid the tediousness of repeating the root so often, when the powers are high, we only put down the root with the index of the power over it thus; a^9 is the ninth power of a ; b^{16} , b^{24} , are the 16th and 24th powers of b . See *Involutions*.

POWER of an Hyperbola, is the sixteenth part of the square of the conjugate axis, or the one fourth part of the square of the semi-conjugate axis, or it is equal to a rectangle under the one fourth of the transverse axis, and one fourth part of the sum of the transverse axis and parameter.

POX, or **SMALL-POX**, *Varicellæ*, in medicine, a contagious disease appearing on the surface of the skin, which it covers with pustules, or ulcerous eruptions, that frequently leave scars behind them.

French Pox, *Lues Venerea*, a malignant and putredinous dyscrasy of all the humours, but especially of the serum and lymph, arising from the venereal taint received into the body; or, according to Sydenham, when a gonorrhœa has continued a long while, or long enough for the poisonous matter to make its way into the blood; or by astringents given unreasonably, it cannot make its exit, then the patient is infected with the French Pox. See *Gonorrhœa*.

The buboes in the groin constitute the first degree of this distemper; then follow pains of the head, joints, of the shoulders, arms, and ancles, coming on by fits, but at no certain intervals, unless in the night, when the patient is warm in bed. See *Bubo*.

There are also scabs and scurfs in various parts of the body, which are as yellow as a honeycomb; sometimes they have large surfaces, answering the description which authors give of the leprosy. All the symptoms gradually increase, especially the pain, which becomes so intense that the patient is unable to lie in bed.

Afterward, nodes or exostoses arise in the skull, shin-bones, and bones of the arms, which being attended with constant pain and inflammation, at length grow carious and putrefied. Phagedenic ulcers likewise seize various parts of the body, but generally first begin with the throat, and from thence gradually creep by the palate

to the cartilage of the nose, which they destroy, and the nose being destitute of its prop, falls down flat. The ulcers and pains daily increasing, the patient sinks under the torment, and one member rotting away after another, is hurried into his grave.

The methods of curing the French pox are principally four: 1. The common one, by salivation. 2. By giving quicksilver-pills. 3. By mercurial frictions, which are to be purged off before a salivation is raised. And, 4. by sweating, with a decoction of guaiacum. For the first of these methods, see *Salivation*.

The second method of curing the French pox is by a quicksilver-pill. This was brought into reputation by Belloste; and though he has kept the composition a secret, yet there is no reason to doubt but it is quicksilver mixed with a certain proportion of cathartic. Turner's imitation of this pill is as follows: take of quicksilver two drachms; turpentine, and pill of colocynth with aloes, of each half a drachm; of which make twelve pills. The quicksilver must be well incorporated with the turpentine till it becomes invisible; and then the pill of colocynth with aloes to be added: sometimes it will require a little crab's eyes, to give it a consistence. If one of these pills be taken night and morning, after the two first days, it will give two or three stools a day, without gripes or sickness. It may be proper, either night or morning, after the pill, to sweat the patient with a pint of the strong decoction of guaiacum, drank hot upon it. In the milder species of this disease, the patient is directed to observe no particular regimen, but may go about his affairs as usual. The method of cure, as is allowed, may be prescribed to very good purpose in this stubborn disease; but it is not thought so effectual as salivation; without which, Turner is of opinion that exostoses and carious topi cannot be cured.

The third method of curing the French pox is by mercurial frictions, which Desault gives as follows: when the patient has a pox of a long continuance, and the venereal poison is dispersed all over the body, he should be prepared by bathing and drinking whey. But in a recent pox the bath is not necessary. After this, instead of raising a salivation, he brings on a flux of the belly, by means of clysters of a decoction of senna, and the pulp of cassia, before the frictions are administered. When he finds that the looseness does not answer the number of frictions,

not

nor the quantity of mercury made use of, he purges the patient with powder of jalap, and procures copious stools. While the looseness is going on, the friction does the office of a purge; and in proportion as they are repeated, the flux of the belly revives; and when it slackens or stops, he has recourse to the clysters and purges of jalap. He pursues this method till the symptoms cease, and till he is persuaded, by the abundance of the evacuations, the venereal poison is entirely drained off. By this means he carries off the pox and gonorrhoea at once. Dr. Douglas not only approved, but used this method with success. The frictions are to be made with mercurial ointment, and one third of quicksilver, from two or three drams to an ounce or an ounce and a half, every night or every other night.

The fourth and last method of curing this distemper is with strong decoctions of guaiacum. This we have the first account of, from Sir Uthic Hutton, who pursued it himself. A pound of guaiacum is to be boiled in a gallon of spring-water, to one half, and the scum reserved to anoint the sores; and a second decoction is to be used for common drink. Boerhaave, who recommends this method, supposes that a salivation will be ineffectual, if every drop of fat in the blood is not melted down into water, and carried off; and the patient reduced to a death-like paleness. He likewise supposes that guaiacum performs its task by resolving all the unctuous particles, whether incorporated in the mass of blood, or accumulated in their proper repositories; and by emaciating the habit so exquisitely, as not to leave one drop of oil therein. He directs the patient to keep in a room of such a warmth, as that its mere heat will incline him to sweat; he advises also, through the whole course of the cure, to abstain from every thing that has the least oiliness in its nature, eating nothing but sea biscuit and raisins, and drinking only a weaker decoction of guaiacum. He must also drink eight ounces every day of the strong decoction, the more the better, till some days his habit is bloated with it, as if he had the dropsy. After this, let the patient every morning drink fasting as much of the decoction as his stomach will hold, and place himself in an erect posture in a sweating-box; or if he lies a-bed, let a stove be put under it. In either place he must receive on his naked body the steam

of kindled spirits of wine, and there let him sweat as long and as plentifully as his strength will allow. After he has suffered this heat for half an hour, let the flame be extinguished, and the patient sweat in his bed about half an hour longer. After which let him take eight or ten ounces of veal-broth boiled in a small quantity of rice, but void of fat. His body must now be carefully wiped with warm dry flannel, after which let him rise and drink of his decoction, as formerly, throughout the day. This must be done morning and evening, in every article; for fourteen days successively; after this, in the morning fourteen days more.

PRACTICE, in arithmetic, *Practica Italica*, or Italian usages, certain compendious ways of working the rule of proportion, or golden rule, especially where the first term is one or unity. They were thus called from their expediting of practice and business, and because first introduced by the merchants and negotiators of Italy.

The most useful of these practices are as follow:—1. Since the use of the rule of three is to find a fourth proportional to three given numbers, divide the first and second, or the first and third, by some common number, if that can be done exactly; and work with the quantities in their stead; as in the following example:

Price of 3lb. is 9 shillings: What is the price of 7lb?

$$\begin{array}{r} 3 \overline{) 9} \\ 3 \end{array}$$

$$3$$

facit 21 shil.

Price of 14lb. is 26 shillings: What is the price of 7lb?

$$\begin{array}{r} 7 \overline{) 26} \\ 2 \end{array}$$

$$1$$

facit 13 shillings.

2. If the first term be 1, and the second an aliquot part of a pound, shilling, or penny; divide the third by the aliquot part, the quotient is the answer.

Note, to find the aliquot part, those who cannot do it otherwise, may see the table of aliquot parts of a pound in the table hereafter.

E. gr. If 1 ell cost 10 shillings: What cost 957 ells?

facit 4781 10 shillings.

3. If the first or third number be 1; the other not exceeding large; and the middle term a compound, i. e. consist of several

several denominations, it may be wrought without reduction, thus:

Price of 1lb. is 3s. 8d. 3q. What is the price of 5lb?

18s. 7d. 3q.

For, four farthings making a penny, 5 times 3 farthings make 3d. 3q, and 12d. making 1s. 5 times 8 pence make 3s. 4d. which, with the 3d. from the place of farthings, make 3s. 7d. Lastly, 5 times 3 shillings make 15s. and with the 3 shillings from the place of pence is 18s. the price required therefore is 18s. 7d. 3q.

4. If the middle term be not an aliquot, but an aliquant part, resolve the aliquant part into its aliquot parts; divide the middle term by the several aliquots, the sum of the quotient is the answer. To find the aliquot parts contained in an aliquant, see the table of aliquant parts of a pound hereafter.

For an instance of this rule: If 1 ell cost 15 shillings: What cost 124 ells?

124) 62
31
facit 931.

5. If the first or second term be 1, and in the former case the second or third; in the latter the first, be resolvable in factors; the whole operation may be performed in the mind without writing down any figures, as in the following example:

Price of 1lb. is 24 shillings: What is

the price of 20lb.

4
6
4
—
80
6

facit 48: 0s.—24l.

6. Where one of the given numbers is 1, we have several compendious usages to save multiplication and division. E. gr. If 9lb. cost 20 shillings: What does 1lb. cost?

It is obvious the sum required is had by adding to the tenth part of 20s. viz. 2s. the ninth part of the tenth, viz. 3d. $\frac{1}{2}$, and $\frac{2}{9}$ of a penny; the answer therefore is 2s. 3d. $\frac{1}{2}$ and $\frac{2}{9}$.

Again, if 5lb. cost 64s: What cost 1lb.

Since 5 is half of 10, the double of the tenth part of the given price, viz. 12s. 9d. 3q. is the sum required,

Again, if 1lb. cost 18d: What will 19lb. cost?

Since 19=20-1; from the given price doubled and increased by a cypher, viz. 360, subtract the simple 18; the remainder is 342 pence=28s. 6d. the sum required.

7. If two terms of the same denomination differ by an unit, we have a peculiar kind of compound, which will be clear from the following examples. E. gr. If 5lb. cost 30s: What will 4lb. cost?

Since the price of 4lb. is 1 part short of that of 5lb. divide the given price 30 by 5, the quotient 6 being subtracted from the dividend, the remainder, viz. 24s. is the sum required.

Again, if 8lb. cost 24s: What cost 9 pounds?

Since the price of 9lb. exceeds that of 8 by 1 part, divide the given price 24 by 8, and add the quotient 3 to the dividend; the sum 27 is the answer.

8. Sometimes one may use several of these compends or practices in the same question. E. gr. If 100lb. cost 30s. 4d. What cost 50lb.

facit 15s. 2d.

Again, if 60lb. cost 4s: What cost 250lb?

42
6
168

A table of the aliquot parts of a pound or 16s. are,

- 10 s. make half of 20s.
- 5 s. a fourth.
- 4 s. a fifth.
- 2 s. a tenth.
- 1 s. a twentieth.
- 6 s. 8 d. a third.
- 3 s. 4 d. a sixth.
- 2 s. 6 d. an eighth.
- 1 s. 8 d. a twelfth.
- 1 s. 4 d. a fifteenth.
- 1 s. 3 d. a sixteenth.
- 10 d. a twenty-fourth.
- 5 d. a forty-eighth.

To multiply by aliquot parts, see the article Multiplication.

A table of the aliquant parts of a pound or 20s. are,

- 3 s. an aliquant part composed of a sixth and 20th.

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- 6s. of a fifth and tenth.
- 7s. of a fourth and tenth.
- 8s. of two fifths.
- 9s. of a fourth and fifth.
- 11s. of a half and a 20th.
- 12s. of a half and a 10th.
- 14s. of a half and a 5th.
- 15s. of a half and a 4th.
- 16s. of a half, a 5th, and 10th.
- 17s. of a half, a 4th, and 10th.
- 18s. of a half and two 5ths.
- 19s. of a half, a 4th, and a 5th.

To multiply by aliquant parts, see *Multiplication*.

PRAGMATIC SANCTION, in the civil law, is defined by Hottoman to be a rescript, or answer of the sovereign, delivered by advice of his council, to some college, order, or body of people, upon consulting him on some case of their community. The like answer given to any particular person, is called simple rescript. The term pragmatic sanction, is chiefly applied to a settlement of Charles VI. emperor of Germany, who, in the year 1722; having no sons, settled his hereditary dominions on his eldest daughter, the archduchess Maria Theresa, which was confirmed by the diet of the empire, and guarantied by Great-Britain, France, the States-General, and most of the powers in Europe.

* **PRAGUE**, a large handsome city of Germany, is seated on the river Moldaw, in the centre of Bohemia, of which it is the capital. It comprehends three towns, the old, the new, and the little city, which are about 15 miles in circumference. It is built on seven hills, from the tops of which are fine prospects, and contains a vast number of houses and inhabitants, there are above 100 churches and as many palaces. The Moldaw, which crosses Prague, separates the small town from the old and new; and the bridge which is over the river is built of free-stone, with 18 arches, and is 34 feet wide, and 1770 long, with a strong tower at each end, and handsome statues on the sides. Old Prague is seated on the side of the river, and is very populous: the houses are high, and the streets narrow. The chief ornament of this part is the university; and the Jesuits college; likewise in this part is the abode of the Jews, who have nine synagogues. The new town surrounds the old, and contains magnificent buildings, handsome churches, and wide streets. Little Prague is the most ancient of the three. One part of this town is built in a bot-

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tom, and the other upon a mountain, and contains 52 palaces of the nobility; some of which have greatly suffered in the late sieges. The French and Bavarians took it by storm in November 1741. It surrendered after a long siege and blockade, to the Austrians in January 1743. In 1744, the king of Prussia sent an army of 80,000 men against it, when the city was bombarded and cannonaded with such fury, that it could not hold out above six days, and the whole garrison were made prisoners of war. But were obliged to abandon it the same year. In 1757, the king of Prussia besieged it again, but without success, and soon after lost a battle near this place. Prague is 152 miles N. W. of Vienna, and 75 S. E. of Dresden, Long. 14. 20. E. Lat. 50. 0. N.

* **PRAGUE**, siege of. The king of Prussia, immediately after his victory at Auwal, invested Prague. About forty thousand of the enemy took refuge in it, the rest fled different ways. The king of Prussia lost no time to invest the place, and to cut off all succours. If on one hand such an immense garrison made an attack unadvisable, on the other, that formidable number itself seemed to make the reduction of the place by famine the more certain. The king of Prussia not relying solely on this, prepared to bombard the town. On the twenty-ninth of May 1757, at midnight, after a most dreadful storm of rain and thunder, as if it were to display how much more ruinous the malice of men may be, than the greatest terrors of nature, on the signal of a rocket, four batteries, which discharged every twenty-four hours two hundred and eighty eight bombs, besides a vast multitude of red hot balls, began to pour destruction on that unfortunate city, which was soon in flames in every part. The garrison made a vigorous defence, and one well conducted and desperate sally: but they were repulsed with great loss. The principal magistrates, burghers, and clergy, seeing their city on the point of being reduced to an heap of rubbish, made the most moving supplications to the commander to listen to terms. The commander was deaf to their prayers. Twelve thousand of the most useless mouths were driven out of the city. The Prussians forced them in again. The affairs of the empress seemed verging to inevitable destruction, a whole army was upon the point of surrendering prisoners of war; the capital of Bohemia on

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on the point of being taken, and with it all the rest of that flourishing kingdom. The sanguine friends of the king of Prussia began to compute the distance to Vienna. However, in consequence of the battle of Collin, he was obliged to raise the siege.

PRAME, among sailors, a sort of lighter employed in different parts of the Baltic sea, to load and deliver ships.

PRASIUS, **PRASITES**, in natural history, the name of a gem much approaching to the nature of the emerald, but wanting its hardness, and being of a coarser green, with an admixture of yellow.

PRATIQUE, or **PRATTIC**, in commerce, a negotiation, or communication, of commerce, which a merchant vessel obtains in the port it arrives in, and the countries it discovers: hence to obtain a pratique, is to obtain a liberty to frequent a port, to go ashore, to buy and sell, &c.

Pratique is particularly used for a licence to traffic, granted to the master of a ship in the ports of Italy upon a bill of health; that is, a certificate that the place whence he came is not annoyed with any infectious disease.

PRAYER, in theology, a petition to God, either for the obtaining some future favour, or the returning thanks for a past one. Divines distinguish three kinds of prayer; vocal, which is clothed in words and sounds, to be uttered by the mouth; mental, which is only formed or conceived in the mind, and not delivered in words; and ejaculatory, which is a short sudden flight, without Rudy, order, or method. Among us prayer is most frequently considered under the divisions of preconceived and extemporary: under the first come all set forms, whether public or private, by which the mind is directed in the order, manner, expression, &c. of its petitions; the second is that where the mind is left to itself, and its own conduct, both as to matter, manner, words, &c.

PREACHING, in theology, the promulgation of the word of God in public: or the making a sermon, or public oration on some passage in the sacred Scriptures, in order to inform the judgment and mend the lives of the hearers.

PREADAMITE, a denomination given to the inhabitants of the earth, who, according to some people, lived before Adam. Isaac de Pereyra, in

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1655, published a book; in which he attempted to prove that the Jews alone were descended from Adam; and that the Gentiles, whom he called Preadamites, lived long before Adam: this book was answered by Demeters, professor of theology at Groningen.

PREAMBLE, in law, the beginning of an act of parliament, &c. which serves to open the intent of the act, and the mischiefs intended to be remedied by it.

PREBEND, the maintenance a prebendary receives out of the estate of a cathedral or collegiate church. Prebends are distinguished into simple and dignitary: a simple prebend has no more than the revenue for its support; but a prebend with dignity, has always a jurisdiction annexed to it.

PREBENDARY, an ecclesiastic who enjoys a prebend.

The difference between a prebendary and a canon is, that the former receives his prebend, in consideration of his officiating in the church; but the latter merely by his being received into the cathedral or college.

Golden **PREBENDARY of Hereford**, called also *Prebendarius Episcopus*, is one of the twenty-eight minor prebendaries, who has, *ex officio*, the first canon's place that falls. He was anciently centessor of the bishop and cathedral, and had the offerings at the altar; on which account he was called the golden prebendary.

PRECEDENCE, or **PRECEDENCY**, a place of honour to which a person is entitled: this is either of courtesy or of right. The former is that which is due to age, estate, &c. which is regulated by custom and civility: the latter is settled by authority, and when broken in upon gives an action at law.

PRECEDENT, in law, a case which has been determined by the court, and which serves as a rule for all of the same nature: thus the precedents of a court will reverse a judgment contrary to many precedents.

PRECENTOR, a dignitary in cathedrals, popularly called the chanter, or master of the choir.

PRECEPT, in law, a command in writing sent by a chief justice, justice of the peace, &c. for bringing a person, record, or other matter, before him.

PRECESSION, *Præcessio*, in astronomy, a term applied to a slow motion of the equinoctial points towards the

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west : that is, in the language of astronomers, *in antecedentia*, or contrary to the order of the signs.

PRECIPITANT, *Præcipitans*, in chemistry, is applied to any liquor, which, when poured on a solution, separates what is dissolved, and makes it precipitate, or fall to the bottom of the vessel.

PRECIPITATE, *Præcipitatus*, in chemistry, a substance which having been dissolved in a proper menstruum, is again separated from its solvent, and thrown down to the bottom of the vessel, by pouring some other liquor upon it.

PRECIPITATION, *Præcipitatio*, a process in chemistry, which is a kind of separation, whereby the particles of a body dissolved and suspended in any menstruous liquor, are detached therefrom, and fall down to the bottom of the vessel. These particles sometimes precipitate of their own accord, but oftener by the assistance of some other liquor added to the menstruum. So that precipitation is the separating solid bodies from any fluid menstruum, wherein they are dissolved, by the addition of a third body, which counteracting the power of the menstruum, causes that which was dissolved to regain its solid form, and subside in the state of a powder.

PRECONTRACT, in law, a contract made before another, chiefly applied to marriage contracts.

PRECORDIA, *Præcordia*, in anatomy, a general name for the parts situated about the heart, in the fore-part of the thorax ; as the diaphragm, pericardium, and even the heart itself, with the spleen, lungs, &c.

PREDESTINATION, in general, signifies a decree of God, whereby from all eternity he ordained such a concatenation of causes as must produce every event by a kind of fatal necessity, notwithstanding any opposition.

Nothing has occasioned more disputes than this thorny subject of predestination ; the Lutherans speak of it with horror, whilst the Calvinists contend for it with great zeal ; the Molinists and Jesuits preach it down as a most dangerous doctrine, whilst the Janfenists assert it as an article of faith ; the Arminians, Remonstrants, and Pelagians are all avowed enemies to predestination.

PREDETERMINATION, in philosophy, that concurrence of God, which determines men in all their actions, both good and evil ; and this concurrence, or

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influence, is called physical predetermination, or premotion ; for divines maintain, that God has no share in the sins of mankind, inasmuch as he only affords his concurrence to the physical part of their actions, not to the moral part.

PREDIAL TITHES, those that are paid of things arising and growing from the ground only ; as corn, hay, fruit, &c.

PREDICABLE, among logicians, denotes a general quality which may be predicated, or asserted of several things : thus animal is predicable of mankind, beasts, birds, fishes, &c.

PREDICAMENT, among logicians, the same with category. See *Category*.

PREDICATE, *Prædicatum* in logic, that part of a proposition which affirms or denies something of the subject : thus, in these propositions, *snow is white, ink is not white*, whiteness is the predicate which is affirmed of snow, and denied of ink.

PREDICTION, *Prædictio*, the foretelling of what is to come, either by divine revelation, art, or conjecture.

PREDOMINANT, that which prevails, or has some superiority, over another thing.

PREENING, in natural history, the action of birds dressing their feathers, to enable them to glide the more readily through the air, &c. For this purpose they have two peculiar glands on their rump, which secrete an unctuous matter into a bag that is perforated, out of which the bird occasionally draws it with its bill.

PRE-EXISTENCE, the state of a thing actually in being before another.

PREFACE, something introductory to a book, to inform the reader of the design, method, &c. observed therein ; and generally whatever is necessary to facilitate the understanding of a book.

PREGNANCY, the state of a woman who has conceived, or is with child.

PRELATE, an ecclesiastic raised to some eminent and superior dignity in the church ; as bishops, archbishops, patriarchs, &c.

PRELIMINARY, in general, denotes something to be examined and determined, before an affair can be treated of to the purpose.

PRELUDE, in music, is usually a flourish or irregular air, which a musician plays off-hand, to try if his instrument be in tune, and so lead him into the piece to be played.

PREMISES, or **PREMISSSES**, in logic,

gic, an appellation given to the two first propositions of a syllogism, as going before, or preceding the conclusion.

PREMISES, in law, properly signifies the land, &c. mentioned in the beginning of a deed.

PREMIUM, or *PREMIUM*, properly signifies a reward or recompence; but it is chiefly used in a mercantile sense for the sum of money given to an insurer whether of ships, houses, lives, &c.

PREMUNIRE, or *PREMUNIRE*, in law, is taken two ways; either for a writ, or for the offence for which it is granted. Formerly the church of Rome carried its pretended right of supremacy to such a height, that several statutes were made to check and restrain the growing power of the pope; but more especially stat. 16 Rich. II. c. 5. commonly known by the name of the statute of premunire, which ordains the punishment of offenders on this statute to be this: that they should be out of the king's protection, attached by their bodies, i. e. imprisoned at the king's pleasure, and lose their lands, goods, and chattels.

Premunire is now chiefly used for the above punishment, which is incurred not only by those who assert the pope's supremacy; but also by those who refuse to take the oath of allegiance, or of the king's supremacy, &c.

It is said no person, who has incurred a premunire, can bring any action; and a writ of premunire lies as well for a party grieved, as for the king; but the laws making offences a premunire are so very severe, that they are seldom put in execution.

PREPARATION, in anatomy, the art of preserving the parts of animals for anatomical uses; which is done either by drying them thoroughly, or putting them in a proper liquor.

PREPOSITION, *Prepositio*, in grammar, one of the parts of speech, being an indeclinable particle, which yet serves to govern the nouns that follow it; such as *per*, *pro*, *propter*; and *through*, *for*, *with*, &c.

PREPUCE, in anatomy, the foreskin; being a prolongation of the cutis of the penis, covering the glans.

PREROGATIVE, a pre-eminence which one person has over another.

PREROGATIVE of the King, that power which the king hath, not only over other persons, but over the ordinary

course of the common law, in right of his crown.

PREROGATIVE *Court*, a court belonging to the archbishop of Canterbury, wherein wills are proved and administration granted that belong to the archbishop by his prerogative; that is, where the party, at his death, had five pounds, or upwards, out of the diocese where he died, and within the archbishop's province.

PRESAGE, *Prasagium*, in antiquity, denotes an augury, or sign of some future event; which was chiefly taken from the flight of birds, the entrails of victims, &c.

PRESBYTA, *presbura*, in optics, a person whose eyes being flat, can see distant objects distinctly, but those near confusedly: which defect of sight got this appellation, because old people are naturally subject to it.

Spectacles, or convex glasses, are the only remedy for this defect; for if these are well fitted to the degree of flatness of the eyes, they cause the rays of light to converge in such a manner from near objects, as to make them fall exactly on the retina, and thereby produce distinct vision. See the article *Vision*.

PRESBYTER, in the primitive christian church, an elder, one of the second order of ecclesiastics; the other two being bishops and deacons.

PRESBYTERIANS, a sect of protestants, so called from their maintaining that the government of the church appointed in the New Testament was by presbyteries; that is, by ministers and ruling elders, associated for its government and discipline.

PRESCIENCE, in theology, foreknowledge, or the knowledge which God has of events before they come to pass.

PRESCRIPTION, in law, is a right or title acquired by use and time, introduced for assuring the property of effects in favour of persons who have for a certain time had them in their possession.

PRESCRIPTION, in medicine, is the assigning a proper and adequate remedy to a disease, from an examination of its symptoms, and an acquaintance with the virtues and effects of the materia medica.

PRESENT, *Præsens*, in grammar, the first tense of a verb, expressing the present time, or that something is now performing; as *scribo*, I write, or am writing. See *Tense*.

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PRESENTATION, in law, the act of a patron offering his clerk to be instituted in a benefice of his gift, the same being void.

PRESENTEE, the clerk presented to a benefice by the patron.

PRESENTMENT, in law, a denunciation of jurors, or a justice of the peace, or other officers, without information of an offence inquirable by the court, to which it is presented; or it may be said to be an information made by the jury in a court before a judge, who has authority to punish any offence committed contrary to law; and it is what the grand jury finds and presents to the court, without any bill of indictment delivered; yet it is afterwards reduced into the form of an indictment.

PRESERVATIVE, among physicians, denotes a medicine taken by way of precaution; or, to secure a man from a disease that threatens him.

PRESIDENT, *Præses*, an officer created or elected to preside over a company, in contradistinction to the other members, who are called residents.

PRESS, *Pres'm*, in the mechanic arts, a machine of wood, or iron, serving to squeeze any body very close.

Presses usually consist of six pieces; two flat smooth planks, between which the things to be pressed are laid; two screws or worms fastened to the lower plank, and passing through two holes in the upper; and two nuts in form of an S, that serve to drive the upper plank, which is moveable, against the lower, which is fixed.

PRESSES used for expressing Liquors, are in most respects the same with the common presses, only the under plank is perforated with a great number of holes for the juice to run through. Others have only one screw, or arbor, passing through the middle of the moveable plank, which descends into a kind of square box, full of holes, through which the juices flow as the arbor is turned.

PRESS used by Joiners, to keep close the panuels, &c. of waincoat, consists of two screws, and two pieces of wood, four or five inches square, and two or three feet long, whereof the holes at two ends serve for nuts to the screws.

PRESS used by Inlayers resembles the joiners press, only the pieces of wood are thicker, and only one of them moveable; the other, which is in form of a tressel, being sustained by two legs joined into it at each end.

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This serves for sawing and cleaving of wood required in marquetry.

Founders PRESS, is a strong square frame, consisting of four pieces of wood firmly joined together with tenons, &c. It is of various sizes: two of them are required to each mould at the two extremes whereof they are placed; so as that, by driving wooden wedges between the mould and sides of the press, the two parts of the mould for the metal may be pressed close together. See the article *Foundry*.

The book-binders press consists of two large wooden cheeks joined by two strong wooden screws; which being turned by an iron bar, draw together or set asunder the cheeks at pleasure.

PRESS, in the woollen manufactory, is a large wooden machine, serving to press cloths, serges, &c. to render them smooth, and give them a gloss.

PRESS for Linens, Silks, &c. is called a calender.

For the *Rolling and Printing PRESS*, see the article *Printing*.

PRESSING, in the manufactures, is the violently squeezing a cloth, stuff, &c. to render it smooth and glossy.

PRESSURE, or **PRESSION**, in general, denotes the squeezing a thing close together.

PREST, a duty in money paid by the sheriff upon his account in the exchequer, for money remaining in his hands.

PREST-MONEY, the money given to new-listed soldiers, so called because it binds those who receive it to be ready at all times.

PRESTATION, signifies the payment of a certain sum by arch-deacons, and other clergymen, annually to their bishop.

PRESTO, in the Italian music, intimates to perform very quick, as *prestissimo* does extremely so.

PRESUMPTION, in law, signifies an opinion or belief of a thing.

PRESUMPTIVE HEIR, the same with heir at law. See *Heir*.

PRETERIT, in grammar, a tense which expresses the time past, or an action completely finished; as, *scripsi*, I have wrote.

PRETEXT, a colour or motive, whether real or feigned, for doing something.

PRETOR, or **PRÆTOR**, a magistrate among the ancient Romans, not unlike our lord chief justices, or lord chancellor, or both in one, as being vested with

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with the power of distributing justice among the citizens.

PRETORIAN GUARDS, *Prætorie Cohortes*, in Roman antiquity, were the emperor's guards, who at length were increased to ten thousand; they had this denomination, according to some, from their being stationed at a place in the palace called *Pretorium*: their commander was styled *Præfectus prætorii*.

PRETORIUM, *Pretorium*, among the Romans, denoted the hall or court wherein the pretor lived, and wherein he administered justice.

PRIAPISM, in medicine, a continual and painful erection of the penis.

PRIAPUS, in medicine, denotes the genital parts in men.

It denotes, in antiquity, a fabulous deity, revered very much for the extraordinary size of his parts.

PRIEST, a person set apart for the performance of sacrifice, and other offices of religion.

PRIEST, in the Christian church, is a person invested with holy orders, in virtue of which he has a power to preach, marry, administer the sacraments, &c.

PRIME VIE, among physicians, denote the whole alimentary duct; including the œsophagus, stomach, and intestines, with their appendages.

PRIMAGE, in commerce, a small duty at the water-side, due to the master and mariners of a ship; to the master, for the use of ropes, &c. to discharge the goods; and to the mariners, for the loading or unloading of the vessel.

PRIMARY PLANET, in astronomy, one that revolves round the sun as a center.

PRIMATE, in church-polity, an arch-bishop who is invested with a jurisdiction over other bishops.

PRIME, an appellation given to whatever is first in order, degree, or dignity, among several things of the same or like kind; thus, we say, the prime minister, prime serjeant, prime cost, &c.

PRIME is sometimes used to denote the same with decimal, or the tenth part of an unit. See the article *Decimal*.

PRIME Vertical, is that vertical circle which passes through the poles of the meridian, or the east and west points of the horizon; whence dials projected on the plane of this circle are called prime vertical, or north and south dials.

PRIMING, or *Prime of a Gun*, is the gunpowder put into the pan or touch-hole of a piece, to give it fire thereby.

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And this is the last thing done in charging.

PRIMING, among painters, signifies the laying on of the first colour.

PRIMITIÆ, the first fruits gathered of the earth, of which the ancients made presents to the gods.

PRIMITIVE, in grammar, a root or original word in a language, in contradistinction to derivative: thus, *God* is a primitive, *godly* derivative, and *god-like* a compound.

PRIMOGENITURE, *Primogenitura*, the right of first-born.

PRINCE, *Princeps*, in polity, a person invested with the supreme command of a state, independent of any superior.

PRINCE also denotes a person who is a sovereign in his own territories, yet holds of some other as his superior.

PRINCE of the Senate, in old Rome, the person who was called over first in the roll of senators, whenever it was renewed by the censors. He was always of consular and censorian dignity.

PRINCE'S FEATHER, in botany, the same with amaranth. See *Amaranthus*.

PRINCIPAL, *Principalis*, the chief and most necessary part of a thing.

In commerce, principal is the capital of a sum due or lent, so called in opposition to interest.

It also denotes the first fund put by partners into a common stock, by which it is distinguished from the calls or accessions afterwards required.

PRINCIPAL POINT, in perspective, a point in the perspective plane, upon which a line drawn from the eye perpendicular to the plane falls. It is in the intersection of the horizontal and vertical plane, and called the point of sight and point of the eye.

PRINCIPAL RAY, in perspective, that which passes perpendicularly from the spectator's eye to the perspective plane.

PRINCIPLE, in general, is used for the cause, source, or origin of any thing.

PRINCIPLES, in physics, are often confounded with elements, or the first and simplest parts whereof natural bodies are compounded, and into which they are again resolvable by the force of fire. See *Element*.

PRINT, the impression taken from a copper-plate.

A print may be taken off, so as that the out-lines and principal strokes may be exactly copied for graving, in the following manner. If the print be not above

above a year or two old, the paper need only be well moistened with water, as for printing; but if it be more ancient, it should be laid to soak all night in water, and afterwards hung in the air till it becomes dry enough for the press. The paper thus prepared is to be laid with its printed side next the plate, thinly eased over with white wax; and is thus to be communicated to the rolling-press, whereby an impression of the cut will be gained.

PRINTER, one who composes and takes impressions from moveable characters ranged in order, or from plates engraved, by means of ink, and a press; or from blocks of wood cut in flowers, &c. and taken off in various colours on calicoes, linens, silks, &c.

PRINTING, the art of taking impressions from characters or figures moveable, or immovable, on paper, linen, silk, &c. There are three kinds of printing; the one from moveable letters for books; the other from copper-plates for pictures; and the last from blocks, in which the representation of birds, flowers, &c. are cut for printing calicoes, linens, &c. the first called common press-printing, the second rolling-press-printing, and the last calicoe, &c. printing. The principal difference between the three consists in this, that the first is cast in relief in distinct pieces, the second engraved in creux, and the third cut in relief, and generally stamped, by placing the block upon the material to be printed, and striking upon the back of it.

Progress of PRINTING. As the Grecian cities contended for the birth of Homer, so do the German printers for that of printing: Mentz, Haerlem, and Strasburg, are the warmest on this point of honour, and these are left in possession of the question, which is not yet decided; though it must be owned that Mentz has always had the majority of voices, John Guttenburg, and John Fust, of Mentz; John Meutel, of Strasburg, and L. John Koster of Haerlem, are the persons to whom this honour is severally ascribed, by their respective countrymen; and they have all their advocates among the learned. However, their first essays were made on wooden blocks, after the Chinese manner. The book at Haerlem, the vocabulary called Catholicon, and the pieces in the Bodleian library, and that of Bennet-college, are all performed in this way; and the impression appears to have been only given on one side of

the leaves; after which the two blank sides were pasted together. But they soon found the inconveniencies of this method, and therefore bethought themselves of an improvement, which was, by making single letters distinct from one another, and these being first done in wood, gave room for a second improvement, which was the making them of metal; and, in order to that, forming moulds, matrices, &c. for casting them. See *Letter*.

From this ingenious contrivance we ought to date the origin of the present art of printing, contradistinguished from the method practised by the Chinese. And of this Shoeffler, or Scheffer, first servant, and afterwards partner and son-in-law of Fust, at Mentz, above-mentioned, is pretty generally allowed to be the inventor; so that he may properly be reckoned the first printer, and the bible, which was printed with moveable letters in 1450, the first printed book; the next was Augustine *De Civitate Dei*, then Tully's *Offices*, printed about the year 1461. In these books they left the places of the initial letters blank, and gave them to the illuminers to have them ornamented and painted in gold and azure, in order to render the work more beautiful, and, as some think, to make their books pass for manuscripts. Thus at present, in some curious works, the initial letter at the beginning of a book, or chapter, is sometimes left out; and a space is left for its being afterwards printed with various ornaments from a copper-plate.

Some authors tell us, that Fust carrying a parcel of bibles with him to Paris, and offering them to sale as manuscripts, the French, upon considering the number of books, and their exact conformity to each other, even to a point, and that it was impossible for the best book-writers to be so exact, concluded there was witchcraft in the case; and, by their actually indicting him as a conjurer, or threatening to do so, extorted from him the secret: and hence the origin of the popular story of Dr. Faustus.

From Mentz, the art of printing soon spread itself throughout a good part of Europe; Haerlem and Strasburg had it very early; which, as the current of authors represent it, occasioned their pretending to the honour of the invention. From Haerlem it passed to Rome in 1467; and into England in 1468, by means of Tho. Bourchier, archbishop of Canterbury, who sent W. Turner, ma-

fier of the robes, and W. Caxton, merchant, to Haerlem, to learn the art. These privately prevailing with Corseilles, an under workman, to come over, a press was set up at Oxford, and an edition of Ruffinus on the creed was printed the same year in octavo. From Oxford, Caxton brought it to London about the year 1470, and the same year it was carried to Paris. Hitherto there had been nothing printed but in Latin, and the vulgar tongues, and this first in Roman characters, then in Gothic, and at last in Italic; but in 1480, the Italians cast a set of Greek types, and they have also the honour of the first Hebrew editions, which were printed about the same time with the Greek. Towards the end of the sixteenth century there appeared various editions of books in Syriac, Arabic, Persian, Armenian, Coptic, or Egyptian characters, some to gratify the curiosity of the learned, and others for the use of the Christians of the Levant. Out of Europe the art of printing has been carried into the three other parts of the world. For Asia we see impressions of books at Goa, and in the Phillippines; at Morocco, for Africa; at Mexico, Lima, Philadelphia, New-York, Boston, &c. for America. The Turks, indeed, rigorously prohibit printing throughout their empire, as imagining that the too frequent communication with books might occasion some change in their religion and government; yet the Jews have several editions of their books printed at Thessalonica, and even at Constantinople.

Chinese PRINTING is performed from wooden planks or blocks, cut like those used in printing of callico, paper, cards, &c.

Rolling Press PRINTING is employed in taking off prints or impressions from copper-plates engraven, etched, or scraped, as in mezzotint. This art is said to have been as ancient as the year 1540, and to owe its origin to Finiguerra, a Florentine goldsmith, who pouring some melted brimstone on an engraven plate, found the exact impression of the engraving left in the cold brimstone, marked with black taken out of the strokes by the liquid sulphur: upon this he attempted to do the same on silver plates with wet paper, by rolling it smoothly with a roller; and this succeeded: but this art was not used in England till the reign of king James I. when it was brought from Antwerp by Speed.

The ink used for copper-plates is a com-

position made of the stones of peaches and apricots, the bones of sheep, and ivory, all well burnt, and called Frankfort black, mixed with nut-oil that has been well boiled, and ground together on a marble, after the same manner as painters do their colours.

* PRIOR, MATTHEW, an elegant and celebrated English poet, was the son of Mr. George Prior, a citizen and joiner of London, where he was born in 1664. His father dying while he was young, he was left to the care of his uncle, a vintner, who behaved to him with the tenderness of a parent. He had him educated at Westminster-school, after which he took him home, intending to bring him up to his own business. But he still prosecuted the study of the classics at his leisure hours, and particularly his favourite, Horace; by which means he was soon taken notice of by the polite company who resorted to his uncle's house. One day, as the earl of Dorset, with several other persons of rank, were at this tavern, the discourse turned upon the Odes of Horace, and the company being divided in their opinions about a passage in that poet, one of the gentlemen said, "We are not like to agree in our criticisms, but if I am not mistaken, there is a young fellow in the house who is able to set us all right!" upon which he named Mr. Prior, who was immediately sent for, and desired to give his opinion of Horace's meaning in the ode under debate. This he did with great modesty, and so much to the satisfaction of the company, that the earl of Dorset determined to remove him to a more agreeable station; and accordingly had him sent to St. John's college in Cambridge, where he at length became fellow of that college. He there contracted an intimate friendship with Charles Montague, afterwards earl of Halifax, in conjunction with whom he wrote a very humorous piece, intitled the Hind and the Panther transferred to the story of the Country Mouse and City Mouse, in answer to Mr. Dryden's poem called the Hind and Panther. Upon the revolution; Mr. Prior was brought to court by the earl of Dorset, and 1690 was made secretary to the earl of Berkeley, plenipotentiary for king William and queen Mary at the congress at the Hague; and afterwards appointed secretary to the earls of Pembroke and Jersey, and Sir William Williamson, ambassadors and plenipotentiaries at the treaty of Ryfwick in

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1697; as he was likewise in 1693 to the earl of Portland, ambassador to the court of France. While he was in that kingdom, one of the officers of the French king's household, shewing him the royal apartments at Versailles, and particularly the paintings of Le Brun, in which are represented the victories of Lewis XIV. asked him whether king William's actions were also to be seen in his palace? "No, Sir," answered Mr. Prior, "the monuments of my master's actions are to be seen every where but in his own house." In 1697 he was made secretary of state for Ireland, and in 1700 was appointed one of the lords commissioners of trade and plantations, and was chosen member of parliament for East Grinstead in Sussex. In 1711 he was made one of the commissioners of customs, and sent minister plenipotentiary into France, for negotiating a peace with that kingdom: but the year after Geo. I. came to the throne, he was recalled from France, and upon his arrival was taken up by a warrant from the house of commons, and soon after strictly examined by a committee of the privy-council. Robert Walpole, Esq; then moved the house of commons for an impeachment against him, and he was ordered into custody: but though he was one of the persons excepted out of the act of grace which passed in 1717, he was at the close of that year discharged from his confinement; upon which he spent the remainder of his days in tranquillity and retirement, chiefly at his estate at Downhall in Essex. He died at the earl of Oxford's seat at Wimpole in Cambridgeshire, the 18th of September 1721, and was interred in Westminster Abbey, where a monument is erected to his memory.

PRIOR, in general, something before or nearer the beginning than another, to which it is compared.

PRIOR, more particularly, denotes the superior of a convent of monks, or the next under the abbot.

Grand PRIOR is the superior of a large abbey, where several superiors are required.

PRISM, *Prisma*, in geometry, an oblong solid contained under more than four planes, whose bases are equal, parallel, and alike situated.

PRISM, in dioptrics, a triangular glass prism, much used in experiments about the nature of light and colours.

PRISMOID, in geometry, a solid

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figure, bounded by several planes, whose bases are right-angled parallelograms, parallel, and alike situated.

PRISON, a gaol, or place of confinement. See *Coast*.

PRISONER, a person restrained or kept in prison upon an action civil or criminal, or upon commandment: and one may be a prisoner on matter of record or matter of fact. A prisoner upon matter of record is he who being present in court, is by the court committed to prison; and the other is one carried to prison upon an arrest, whether it be by the sheriff, constable, or other officer.

PRIVATEERS, in maritime affairs, a kind of private ships of war, fitted out by private persons at their own expence, who have leave granted them to keep what they can take from the enemy, allowing the admiral his share.

PRIVATION, in general, denotes the absence or want of something; in which sense darkness is only a privation of light.

PRIVATIVE, in grammar, a particle which, when prefixed to a word, changes it into a contrary sense.

Among the Greeks the α is used as a privative, and among the Latins, *in*. The English, French, &c. borrow both the Greek and Latin privatives.

PRIVATIVE QUANTITY, or **NEGATIVE QUANTITY**, in algebra, denotes a quantity less than nothing, in opposition to affirmative or positive; and is expressed by the sign ($-$) minus, prefixed thereto.

PRIVILEGE, in law, some peculiar benefit granted to certain persons or places, contrary to the usual course of the law. Privileges are said to be personal or real. Personal privileges are such as are extended to peers, ambassadors, members of parliament, and of the convocation, and their menial servants, &c.

PRIVY, in law, denotes one who is partaker, or has an interest in an affair.

PRIZE, or **PRISE**, in maritime affairs, a vessel taken at sea from the enemies of a state, or from pirates; and that either by a man of war, a privateer, &c. having a commission for that purpose.

PROBABILITY is nothing but the appearance of the agreement or disagreement of two ideas by the intervention of proofs whose connection is not constant and immutable, or is not perceived to be so; but is, or appears for the most part to be so, and is enough to induce the mind

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mind to judge the proposition to be true or false, rather than the contrary.

Of probability there are degrees from the neighbourhood of certainty and demonstration, quite down to improbability and unlikeliness; even to the confines of impossibility; and also degrees of assent, from certain knowledge, and, what is next to it, full assurance and confidence, quite down to conjecture, doubt, distrust, and disbelief.

That proposition then is probable for which there are arguments or proofs to make it pass or be received for true. Probability being then to supply the defect of our knowledge, is always conversant about a thing whereof we have no certainty; but only some inducements to receive it for true. The grounds of it are, in short, these two following:

First, the conformity of any thing with our own knowledge, experience, or observation.

Secondly, the testimony of others vouching their observation and experience. In the testimony of others is to be considered, 1. the number; 2. the integrity; 3. the skill of the witnesses; 4. the design of the author, if it be a testimony cited out of a book; 5. the consistency of the parts and circumstances of the relation; 6. contrary testimonies. The mind, before it rationally assents or dissents to any probable proposition, ought to examine all the grounds of probability, and see how they make more or less for or against it; and upon a due balancing the whole, reject or receive it, with a more or less firm assent, according to the preponderancy of the greater grounds of probability on one side or the other.

PROBABILITY, in poetry, the appearance of truth in the fable or action of a poem.

PROBATE of a will or testament, in law, is the exhibiting and proving of last wills and testaments before the ecclesiastical judge delegated by the bishop who is ordinary at the place where the party died.

PROBATION, in the universities, the examination and trial of a student who is about to take his degrees.

PROBATION, in a monastic sense, signifies the year of novitiate which a religious must pass in a convent, to prove his virtue and vocation, and whether he can bear the severities of the rule.

PROBATIONER, in the church of Scotland, a student in divinity, who

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bringing a certificate from a professor in an university of his good morals, and his having performed his exercises to approbation, is admitted to undergo several trials.

PROBATUM EST, *it is proved*, a term frequently subjoined to a receipt for the cure of some disease.

PROBE, a surgeon's instrument for examining the circumstances of wounds, ulcers, and other cavities, searching for stones in the bladder, &c.

PROBLEM, in logic, a proposition that neither appears absolutely true or false; and consequently may be asserted either in the affirmative or negative.

PROBLEM, in geometry, a proposition, wherein some operation, or construction is required; as to divide a line, or angle, erect or let fall perpendiculars, &c.

PROBLEM, in algebra, a question or proposition which requires some unknown truth to be investigated, and the truth of the discovery demonstrated. So that a problem is to find a theorem.

Kepler's PROBLEM, in astronomy, is the determining a planet's place from the time; so called from Kepler, who first proposed it. It was this, to find the position of a right line, which, passing through one of the foci of an ellipsis, shall cut off an area described by its motion, which shall be in any given proportion to the whole area of the ellipsis. See *Anomaly*.

PROBLEMATICAL RESOLUTION, in algebra, a method of solving difficult questions by certain rules, called canons.

PROBOSCIS, in natural history, the trunk or snout of an elephant, and some other animals and insects.

PROCEDURE, or PROCEEDING, in law, the course of the several acts, instructions, &c. of a process or law-suit.

It is either civil or criminal: civil procedure relates to the estate alone; criminal or extraordinary procedure, where the person is prosecuted.

PROCEED, among merchants, whatever arises from any thing.

PROCESS, in law, denotes the proceedings in any cause real or personal, civil or criminal, from the original writ to the end thereof.

PROCESS, in chemistry, the whole course of an experiment or series of operations, tending to produce something new.

PROCESS, in anatomy, denotes any protuberance or eminence in a bone.

PROCLAMATION, a public notice given

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given of any thing of which the king thinks proper to advertise his subjects.

PROCONSUL, a Roman magistrate, sent to govern a province with consular authority.

PROCREATION, the begetting and bringing forth children.

PROCTOR, a person commissioned to manage another person's cause in any court of the civil or ecclesiastical law.

PROCTORS, in an university, two officers chosen from among the students, to see good order and exercises daily performed.

PROCURATOR, one who has a charge committed to him to act for another.

PROCYON, in astronomy, a fixed star of the second magnitude in the constellation called Canis Minor.

PRODUCING, in geometry, signifies the drawing out a line farther, till it has any assigned length.

PRODUCT, in arithmetic and geometry, the factum of two or more numbers, or lines, &c. into one another: thus $3+4=20$, the product required.

PROFESSOR, in the universities, a person who teaches or reads public lectures in some art or science from a chair for the purpose.

PROFILE, in architecture, the draught of a building, fortification, &c. wherein are expressed the several heights, widths and thickneses, such as they would appear were the building cut down perpendicularly from the roof to the foundation. It is also called section, of orthographical section, and by Vitruvius, scia-graphy. This is the same as elevation, in opposition to a plan, which is called ichnography.

PROFILE also denotes the out-line of a figure, building, member of architecture, &c. Hence profiling sometimes denotes designing or describing the member with a rule, compass, &c.

PROFILE, in sculpture and painting, denotes a head, portrait, &c. when represented sidewise, or in a side-view. On almost all medals, faces are represented in profile.

PROGNOSTIC, among physicians, signifies a judgment concerning the event of a disease, as whether it shall end in life or death, be short or long, mild or malignant, &c.

PROGRESSION, in general, a regular advancing, or going forward, in the same course and manner.

PROGRESSION, in the mathema-

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tics, is either arithmetical or geometrical.

PROHIBITED GOODS in commerce, the same with contraband goods.

PROHIBITION, in law, a writ that issues out of the chancery, King's Bench, or Common Pleas, to prohibit some other court, either spiritual or secular, to proceed in a cause there depending, upon a suggestion that the cause does not belong to the court.

PROJECTILE, or *Project*, in mechanics, any heavy body put into motion by an external force impressed thereon, and dismissed from the agent and left to pursue its course.

PROJECTION, in mechanics, the act of giving a projectile its motion. If the direction of the force, whereby the projectile is put in motion, be perpendicular to the horizon, the projection is said to be perpendicular; if parallel to the apparent horizon, a horizontal projection: if it make an oblique angle, the projection is oblique.

PROJECTION of the Sphere, in plano, a representation of the several points of the surface of the sphere, and the circles described thereon, or any assigned parts thereof, such as they appear to the eye situate at a given distance upon a transparent plane placed between the eye and the sphere.

The projection of the sphere is either orthographic, stereographic, or gnomonic.

Orthographic PROJECTION of the Sphere, is that wherein the circles of the sphere are drawn on a plane; the eye being placed at an infinite distance, vertically to one of the hemispheres.

Stereographic PROJECTION of the Sphere, that on which our maps are commonly made, and depends on this principle, that if the plane of any meridian be supposed the plane of the projection, then an eye, placed in one pole of that meridian, will project all the circles in the opposite hemisphere into circular arches on the said plane.

Gnomonic PROJECTION of the Sphere, is the projection of the several circles of the sphere, on a plane which touches the surface of the sphere, the eye being placed in the center. See *Dialing*.

PROJECTURE, in architecture, the out-jetting, prominence, or embossing, which the mouldings and other members have beyond the naked wall, column, &c. and is always in proportion to its height. The word is always applied to galleries, balconies, &c. which jet out beyond the face of the wall.

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PROLAPSUS, in surgery, a prolapsion, or falling out of any part of the body from its natural situation : thus we say, *prolapsus intestini*, a prolapsion of the intestine, &c.

PROLAPSUS ANI is such a prolapsion of the intestinum rectum, that it is frequently inverted or prolapsed to such a degree both in adults and infants, as to appear near a handbreadth hanging out of its natural situation. Heister thinks, that the cause of this disorder may be a great weakness or relaxation in the rectum, which frequently happens to cross and clamorous children, or from a tenesmus, violent pains of the piles, a dysentery, a stone, or ulcer in the bladder, a difficult expulsion of the birth, or the faeces, &c. The disorder is not difficult to cure when recent and the patient not weak ; but in the contrary circumstances, to effect a perfect cure is next to impossible. If a gangrene or cancer should infect the rectum, as in such cases it may, the above-mentioned author advises the application of discutient and emollient remedies, and if they prove unsuccessful, an extirpation of the morbid part. The reduction of the intestine, which should be effected as soon as possible, is done and retained in the same manner as is directed in returning and retaining the prolapsed intestines in wounds of the abdomen. See *Abdomen*.

PROLAPSUS OCULI, a distemperature of the eye, in which it is so violently inflamed and swelled, that it cannot be contained in its orbit, but protrudes itself out of its natural seat. The causes of this disorder are various, proceeding sometimes from a violent inflammation, or a redundancy of humours in the eye, from an obstruction of the ductory vessels, and sometimes from a schirrhous, cancer, or some external violence. When the disorder is recent, and occasioned by humours, they may be generally dispersed, according to Heister, by bleeding, purging, and vesicatories, with internal attenuants and diluents, and external discutient fomentations. But if the case is too obstinate to yield to remedies, recourse must be had to the surgical operation of the paracentesis, as in other dropsical cases.

PROLAPSUS UTERI is when the uterus falls down and appears out of the vagina : whereas when it only descends into the vagina, it is termed a descent, or bearing down of the womb. The apparent and most general cause of a pro-

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lapsus uteri is from too great a relaxation and weakness of its ligatures, and of the vagina, and is observed most frequently to follow a difficult labour, or other violent straining, though it may sometimes happen even to maids and young girls : as to the other species of this disorder called the descent of the womb, wherein the prolapsed uterus is inverted like a bag, so that its internal surface appears outermost, which at the same time lies concealed in the vagina, it is never observed but when the uterus is forced down together with the secundines, or after a difficult labour ; and if it is not speedily reduced, the case soon becomes past cure, and kills the patient.

PROLAPSUS VAGINÆ, or a bearing down of the vagina, is often confounded with the prolapsus uteri, inasmuch that they are often called by the same name ; not being easily distinguishable from each other. Heister takes a prolapsus of the vagina to happen when that body appears either wholly or in part without the labia pudendi ; and a total prolapsion shews itself without the relaxed labia, like a fleshy ring, red or bloody, and swelled more or less, according to particular circumstances. If the prolapsed parts are inflamed, discutient fomentations and cataplasms are to be applied externally, and bleeding and the other internal medicines directed under the article *Inflammation*.

PROLAPSUS UVULÆ, a disorder of the uvula, which is sometimes so much enlarged and elongated as even to reach the larynx and pharynx, and obstruct the actions both of respiration and deglutition. It proceeds from a recent inflammation, as may be judged from the pain, heat, and redness of the circumjacent parts, the patient may be relieved with cooling gargles, and injections of wine and water, or a decoction of proper herbs with a little alum ; but at the same time proper coolers must be used internally, with bleeding, purges, and clysters, to prevent the inflammation from spreading through the fauces, and exciting a quinsy. When this disorder continues, notwithstanding the use of remedies, it will be necessary, depressing the tongue with a spatula, to clip off the redundant part of the uvula with a pair of scissors ; after which the blood being permitted to run a little time, it may be restrained by a gargle of warm wine, vinegar, or if it still continues, apply a little alum or a cautery, till the hæmorrhage ceases.

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PROLATE, in geometry, an epithet applied to a spheroid produced by the revolution of a semi-ellipsis about its larger diameter.

PROLEGOMENA, in philology, certain preparatory observations or discourses prefixed to a book, &c. containing something necessary for the reader to be apprised of to enable him the better to understand the book, or to enter deeper into the science, &c.

PROLEPSIS, a figure in rhetoric by which we anticipate or prevent what might be objected by the adversary; thus, *it may be objected*, &c.

PROLOCUTOR of the Convocation, the speaker or chairman of that assembly.

PROLOGUE, in dramatic poetry, a discourse addressed to the audience before the drama or play begins. The original intention was to advertise the audience of the subject of the piece, and to prepare them to enter more easily into the action, and sometimes to make an apology for the poet. The last article seems entirely to have taken possession of the prologue in the British drama. The French have left off the use of prologues: those few they use have nothing in them of the genuine prologue, as bearing no relation to the subject, but being mere flourishes or harangues in praise of the king, &c.

PROMETHEUS, in the ancient astronomy, the name of the constellation now called Hercules. See *Hercules*.

PROMISE, in law, is when upon any valuable consideration one binds himself by word of mouth to another to perform a thing agreed on. It is held upon such a promise that action will lie for breach, which will not if the promise be without consideration, that being a naked bargain, from which no action can arise.

PROMONTORY, in geography, a high point of land or rock projecting out into the sea; the extremity of which towards the sea, is called a cape or headland.

PROMPTER, in the drama, an officer whose business it is to watch attentively the actors speaking on the stage, in order to suggest and put them forward when at a stand, to correct them when amiss, &c. in their parts.

PROMULGATED, or **PROMULGED**, something published or proclaimed, and generally applied to a law to denote the publishing or proclaiming it to the people.

PRONATORS, in anatomy, two muscles of the radius, which serve to turn the

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palm of the hand downwards, and are distinguished by the names of *rotundus* and *quadratus*.

PRONG-HOE, in husbandry, the name of an instrument used to hoe or break the ground near and among the roots of plants.

PRONOUN, in grammar, a declinable part of speech, which being put instead of a noun, points out some person or thing.

Pronouns are divided into the six following classes, viz. demonstrative pronouns; relative pronouns; possessive pronouns; gentile pronouns, or such as denote a person's country, as *nostros*, *vestras*, and *suas*; interrogative pronouns, and reciprocal pronouns. See *Demonstrative*, *Relative*, &c.

PRONUNCIATION, *Pronunciatio*, in grammar, the manner of articulating or sounding the words of a language.

To give a just idea of the pronunciation of a language, it seems necessary to fix as nearly as possible all the several sounds employed in the pronunciation of that language.

PRONUNCIATION is also used for the fifth and last part of rhetoric, which consists in varying and regulating the voice agreeably to the matter and words, so as most effectually to persuade and touch the hearers. It is much the same with what is otherwise called emphasis.

PROOF, in arithmetic, an operation whereby the truth and justness of a calculation is examined and ascertained. The proper proof is always by the contrary rule: thus subtraction is the proof of addition, and multiplication of division; and *vice versa*.

PROOF, in law, &c. denotes the mediums or arguments used to evince the truth of any thing.

PROOF is also used in a synonymous sense with standard: thus we call that proof spirit, which is of the standard strength, or half alcohol half phlegm.

PROPAGATION, the act of multiplying the kind, or of producing the like in the natural way of generation.

PROPER, *Proprium*, something naturally and essentially belonging to any thing.

PROPER, in grammar, is applied to nouns, or names which are distinguished into proper and appellative.

PROPERTY, in a general sense, that which constitutes or denominates a thing proper: or it is a particular virtue or quality which nature has bestowed on some

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some things exclusive of all others. Thus colour is a property of light; extension, figure, divisibility, and impenetrability, are properties of body, &c.

PROPERTY, in law, is defined to be the highest right a person has or can have, to any thing; it being used to denote that right which one has to lands or tenements, goods, or chattels, in no respect depending upon another's courtesy.

PROPHECY, a prediction made by divine inspiration.

Mr. Whiston condemns all allegorical explanations of the prophecies of the Old Testament cited in the New, as weak, enthusiastic, &c. and adds, that if a double sense of the prophecies be allowed and there be no other method of shewing their completion than by applying them secondarily and typically to our Lord, after having been in their first and primary intention long ago fulfilled in the times of the Old Testament, we lose all the real advantages of the ancient prophecies as to the proof of christianity. He therefore sets up a new scheme in opposition thereto: he owns that taking the present text of the Old Testament for genuine, it is impossible to expound the apostles citations of the prophecies of the Old Testament on any other than the allegorical foundation; and therefore to solve the difficulty, he is forced to have recourse to a supposition contrary to the sense of all Christian writers before him, viz that the text of the Old Testament has been greatly corrupted since the apostolical age by the Jews.

Persons pretending to prophecies are punishable at common law, by statute; likewise if any person publish such prophecies with an intent to raise sedition, they shall forfeit 10*l*. for the first offence, and suffer a year's imprisonment; and for the second, incur the forfeiture of all their goods, &c.

PROPHET, in general, one who foretells future events, but is particularly applied to such inspired persons among the Jews as were commissioned by God to declare his will and purposes to that people. Among the canonical books of the Old Testament, we have the writings of sixteen prophets, four of which are denominated the greater prophets, viz. Isaiah, Jeremiah, Ezekiel, and Daniel, so called from the length or extent of their writings, which exceed those of the others, viz. Hosea, Joel, Amos, Obadiah, Jonas, Micah, Nahum, Habakkuk, Haggai, Zachariah, and Malachi, who are called

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the lesser prophets from the shortness of their writings. The Jews do not place Daniel among the prophets, because they say he lived the life of a courtier rather than that of a prophet.

PROPTIATION, in theology, a sacrifice offered to God to assuage his wrath, and render him propitious. Among the Jews there were both ordinary and public sacrifices, as holocausts, &c. offered by way of thanksgiving: and extraordinary ones, offered by particular persons guilty of any crime, by way of propitiation. The Romish church believe the mass to be a sacrifice of propitiation for the living and the dead. The reformed churches allow of no propitiation but that one offered by Jesus Christ on the cross. Propitiation was also a feast among the Jews, celebrated on the tenth of the month Tisri, in commemoration of the pardon proclaimed to their forefathers by Moses on the part of God, who thereby remitted the punishment due to the crime of their worshipping the golden calf.

PROPTIATORY, or **MERCY-SEAT**, among the Jews, was the cover or lid of the ark of the covenant. See *Ark*.

The cherubims spread their wings over the propitiatory.

PROPORTION, in arithmetic, the identity or similitude of two ratios, magnitudes or quantities, A, B; C, D, are said to be proportional, the first A to the second B, and the third C to the fourth D, when the ratio of the first A to the second B is the same thing with the ratio of the third C to the fourth D; or which is the same thing, when the first A as often contains or is contained in the second B, as the third C contains or is contained in the fourth D. Thus the numbers, 4, 8, 12, 24, are proportional numbers, because the first number 4 is as often contained in the second number 8, as the third number 12 is contained in the fourth number 24, that is, twice; and which is therefore called the common ratio.

Whence it follows, that magnitudes, which to one and the same magnitude have the same ratio, are equal the one to the other, and, if a magnitude have the same ratio to other magnitudes, those magnitudes are equal one to the other, Which is the ninth prop. of Euc. v.

Now, in the comparing the quantities A B C D together, if the ratio of the second B to the third C is found to be the same

same with the ratio of the first A to the second B, and of the third C to the fourth D; then these four quantities A, B, C, D, are said to be in geometric proportion continued, or sometimes in geometric progression, and are therefore called professional numbers; and so for any greater number, viz. 5, 6, 7, &c. Thus, the numbers $\frac{1}{2}$, $\frac{1}{4}$, 1, 2, 4, 8, 16, 32, &c. or, 81, 27, 9, 3, 1, $\frac{1}{3}$, $\frac{1}{9}$, &c. are in geometric proportion continued, because there is the same constant ratio between them, and are therefore called professional numbers, or geometrical series; the first of which is called an increasing series, because it is generated by a continual multiplication; the second is called a decreasing series, inasmuch as it is generated by continual division.

When 3, 4, or more quantities, A, B, C, D, &c. are continually proportional, the first A shall have a duplicate ratio to the third C, of that it has to the second B, as being compounded of the ratios of the first to the second, of the second to the third, and of the third to the fourth; so always in order one more, as the proportion shall be expressed.

In comparing the quantities A B C D together, if the ratio of the second quantity B to the third C be greater or lesser than the ratio of the first A to the second B, or of the third C to the fourth D; then those quantities A B C D, are said to be in geometric proportion discontinued; thus in the numbers 4, 8, 24, 48, because the ratio of the second 8 to the third 24 is triple greater than the ratio of the first 4 to the second 8, or of the third 24 to the fourth 48, which is but double, therefore, those 4 numbers are in geometric proportion discontinued, and the sign for discontinued proportion is :: and, where the sign is placed, it shews that there the proportion is interrupted, and begins a-new, and accordingly, where four quantities are thus expressed A : B :: C : D, they are thus to be read, as A is to B, that is, in proportion to B, as C is to D.

From these premisses duly considered, all the various properties of proportional numbers or quantities will be easily investigated.

Inverse or Reciprocal PROPORTION, is when, of four numbers, or quantities, the third bears the same proportion to the first, as the second does to the fourth. See Rule of three Inverse.

Harmonical PROPORTION is when four numbers, or quantities are taken in a cer-

tain order, the first having the same ratio to the fourth, as the difference of the first and second has to the difference of the third and fourth. Example 9, 12, 16, 24 : are harmonically proportional, viz. $9 : 12 :: 12 - 9 : 24 - 16$ (or $9 : 24 :: 3 : 8$) but if the first is to the fourth, as the difference of the first and second it is called contra-harmonical proportion; as 2, 8, 4, 6, where $2 : 6 :: 6 - 4 : 8 - 2$ (i. e. $2 : 6 :: 2 : 6$.)

This kind of proportion may exist also between three numbers, one of which is compared as a middle term to both the extremes; that is, if the first has the same ratio to the third, as the difference of the first and second to the difference of the second and third; or as the difference of the second and third to that of the first and second; for such coincide with the former, by taking the middle term twice. Example 3, 4, 6, are harmonical, because $3 : 6 :: 4 - 3 : 6 - 4$ (viz. $3 : 6 :: 1 : 2$) and these contra-harmonical 3, 5, 6; because $3 : 6 :: 6 - 5 : 5 - 3$ (viz. $3 : 6 :: 1 : 2$.) And if in a series of numbers every 3 terms are harmonical, it is a harmonical series or progression (i. e. a series of conjunct or continued harmonials.) Example 10, 12, 15, 20, 30, 60, where in every 3 terms next together are harmonical. And when of 4 terms the 2 middle are different, that may be called disjunct harmonical proportion.

But this considerable difference is to be observed between this kind of proportion and the former, that in a series of continued harmonials every four terms adjacent will not also be harmonical, as they are geometrical or arithmetical in these kinds of progression. Example. Though 10, 12, 15, are harmonical, and also 12, 15, 20; yet 10, 12, 15, 20, are not so.

If we take the word proportion strictly, according to the general definition, for an equality of similar relations between two numbers, then it must be owned there is no new species of proportion here; for there is no new kind of relation in any two terms, but only a mixed comparison between two numbers and their differences from others; and the proportion constituted is really a geometrical one, or an equality of ratios; not indeed of the given numbers, but of the ratio of the extremes compared to the ratio of the differences of these extremes with the middle terms: but though this is not strictly a proportion among the given numbers immediately together, yet it is certainly a complex

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complex and new relation (distant from the immediate arithmetical or geometrical relation between the several couplets or numbers themselves) to which, also, the name of proportion is applied.

This denomination of harmonical arises from music; because the relations or proportions of sounds that make harmony, are found to be of the kind here defined, of which a more particular explanation may be seen under the article *Concord*.

PROPORTION is also used for the relation between unequal things of the same kind, whereby their several parts correspond to each other with an equal augmentation or diminution.

Thus, in reducing a figure into little, or enlarging it, care is taken to observe an equal diminution, or enlargement, through all its parts; so that if one line, e. gr. be contracted by one-third of its length, all the rest shall be contracted in the same proportion.

The making reductions of this kind is the great use of the proportional compasses.

PROPOSITION, in logic, part of an argument wherein some quality, either negative or positive, is attributed to a subject; or according to Chauvinius, it is a complete consistent sentence, indicating or expressing something either true or false, without ambiguity, as, God is just.

PROPOSITION, in mathematics, is either some truth advanced and shewn to be such by demonstration; or some operation proposed, and its solution shewn. If the proposition be deduced from several theoretical definitions compared together, it is called a theorem; if from a praxis, or series of operations, it is called a problem.

PROPRIETOR, or **PROPRIETARY**, he who has the property of any thing.

PROPRIETY, in grammar, is where the direct and immediate signification of a word agrees to the thing it is applied to; in which sense it is used in opposition to figurative, or remote signification.

PRO RATA, in commerce, a term sometimes used by merchants for, in proportion; as, "Each person must reap the profit or sustain the loss *pro rata* to his interest, that is, in proportion to his stock."

PROROGATION, the act of prolonging, adjourning, or putting off to another time. The difference between a prorogation and an adjournment of par-

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liament is, that by prorogation the session is ended, and such bills as passed in either house, or both houses, and had not the royal assent, must, at the next assembly, begin again; because that every session of parliament is in law a several parliament: whereas, if the parliament be only adjourned, there is no new session, and consequently all things continue in the same state they were in before the adjournment. See *Parliament*.

PROSCRIPTION, a publication made in the name of the chief or leader of a party, whereby he promises a reward to any one who shall bring him the head of one of his enemies.

PROSE, the natural language of mankind, loose and unconfined, by poetical measures, rhymes, &c. in which sense it stands opposed to verse.

PROSECUTOR, in law, he that pursues a cause in another's name.

PROSELYTE, a new convert to some religion or religious sect.

* **PROSERPINE**, in fabulous history, the daughter of Jupiter and Ceres. She was carried off by Pluto as she was gathering flowers with her companions. Ceres, disconsolate for the loss of her daughter, after having long sought for her, heard where she was, and intreated Jupiter to let her return from hell. The request Jupiter granted, on condition that she had tasted nothing in Pluto's dominions. Ceres therefore went after her; but when her daughter was preparing to return, Ascalaphus gave information that he had seen Proserpine eat part of a pomegranate, which she had gathered in Pluto's garden, on which she was sentenced to continue in Tartarus, in the quality of Pluto's spouse, and the queen of those gloomy regions: but to mitigate the grief of Ceres for her disappointment, Jupiter consented that her daughter should only pass six months together in hell with her husband, and the other six on earth with her mother. Some mythologists imagine that the latter part of the fable alludes to the corn, which must remain all the winter hid in the earth, in order to sprout forth in the spring, and produce the harvest.

PROSODY, that part of grammar which treats of the quantities and accents of syllables, and the manner of making verses.

PROSOPOEIA, a figure in rhetoric, whereby we raise qualities, or things inanimate, into persons. This figure is divided into two parts: 1. when good and bad

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had qualities, accidents, and things inanimate, are introduced as living and rational beings.

The second part of this figure is when we give a voice to inanimate things, and make rocks, woods, rivers, buildings, &c. express the passions of rational creatures.

PROSTATĀ, in anatomy, a gland generally supposed to be two separate bodies, though in reality but one, of a roundish, or somewhat heart-fashioned shape, situated just before the neck of the bladder, and surrounding the beginning of the urethra.

PROSTHESIS, in grammar, the prefixing some letter or syllable at the beginning of a word, as in *gnatus* for *natus*, &c.

PROTECTION, the shelter, defence, authority, and aid employed by any one in behalf of another.

PROTECTOR, one who undertakes to shelter and defend the weak, helpless, and distressed.

PROTECTOR is also sometimes used for a regent of a kingdom, made choice of to govern it during the minority of a prince.

PROTEST, in law, is a call of witness, or an open affirmation that a person does, either not at all, or but conditionally, yield his consent to any act, or to the proceeding of any judge in a court in which his jurisdiction is doubtful; or to answer upon his oath farther than he is bound by law.

PROTEST, in commerce, a summons wrote by a notary public to a merchant, banker, or the like, to accept or discharge a bill of exchange drawn on him, after his having refused either to accept or pay it.

PROTESTANT, a name first given in Germany to those who adhered to the doctrine of Luther; because in 1529, they protested against a decree of the emperor Charles V. and the diet of Spire; declaring that they appealed to a general council. The name has also been given to those of the sentiments of Calvin, and is now become a common denomination for all those of the reformed churches.

PROTHONOTARY, a term which properly signifies first notary, and which was anciently the title of the principal notaries of the emperors of Constantinople.

PROTHONOTARY with us is used for an officer in the court of King's Bench and Common Pleas; the former of which courts has one, and the latter three. The Prothonotary of the King's Bench

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records all civil actions sued in that court; as the clerk of the crown-office does all criminal cases.

PROTHYRUM, in architecture, a porch at the outer door of a house.

PROTO-TYPE is the original or model after which a thing was formed, but chiefly used for the patterns of things to be engraved, cast, &c.

PROTRACTION, in surveying the same with plotting.

PROTRACTOR, in surgery, a kind of forceps, so called from extracting foreign bodies out of wounds.

PROTRACTOR is also the name of an instrument used for protracting or laying down on paper the angles of a field, or other figure.

PROTUBERANCE, in anatomy, any eminence, whether natural or preternatural, that projects or advances out beyond the rest.

PROVEND, or **PROVENDER**, originally signified a kind of vessel containing the measure of corn daily given to a horse, or other beast of labour, for his subsistence: but it is now used for all the food given to cattle.

PROVERB, according to Camden, a concise, witty, and wise speech, grounded upon experience, and for the most part containing some useful instruction.

Book of PROVERBS, a canonical book of the Old Testament, containing a part of the proverbs of Solomon, the son of David, king of Israel. The first twenty-four chapters are acknowledged to be the genuine work of that prince; the next five chapters are a collection of several of his proverbs, made by order of king Hezekiah; and the two last seem to have been added, though belonging to different and unknown authors, Agur the son of Jakeh, and king Lemuel. In this excellent book are contained rules for the conduct of all conditions of life; for kings, courtiers, masters, servants, fathers, mothers, children, &c.

PROVIDENCE, the conduct and direction of the several parts of the universe, by a superior intelligent being. The notion of a providence is founded on this supposition, that the Creator has not so fixed and ascertained the laws of nature, nor so connected the chain of second causes, as to leave the world to itself; but that he still preserves the reins in his own hands, and occasionally interposes, alters, enforces, restrains, and suspends those laws by a particular interposition. Some, with the Epicureans, deny a providence,

vidence, as imagining it inconsistent with the happiness of the divine nature. Others again deny the existence of a providence, on account of the seemingly unjust distribution of good and evil. Simplicius argues thus for a providence: If God do not look to the affairs of the world, it is either because he cannot or will not; but the first is absurd, since to govern cannot be difficult, when to create was easy; and the latter is both absurd and blasphemous.

The sentiments of Cicero are likewise very precise and pertinent to this purpose: he thinks it impossible for one who duly considers the innumerable objects of the universe, and their invariable order and beauty, to entertain the least doubt, but that there is some efficient cause who presides over and directs the mighty fabric! Nay he lays it down as a fundamental principle of all societies, that there is a divine providence, which directs all events, observes the actions of mankind, whether good or bad, discerns the very intention of the heart, and will certainly make a difference between good men and the wicked.

PROVINCE, in geography, a division of a kingdom or state, comprising several cities, towns, &c. all under the same government, and usually distinguished by the extent either of the civil or ecclesiastical jurisdiction.

PROVISO, in law, a condition inserted in a deed, upon the observance of which the validity of the deed depends.

PROVOCATIVE, in physic, a medicine which is supposed to strengthen nature, and incites to venery.

PROVOST, an officer, whereof there are divers kinds, civil, military, &c.

PROVOST of a city or town, is the chief municipal magistrate in several trading cities, particularly Edinburgh, Paris, &c. being much the same with mayor in other places.

PROVOST Marshal of an Army, is an officer appointed to seize and secure deserters, and all other criminals.

PROXY, one who officiates as a deputy in the room of another.

PRUNES, in commerce, plums dried in the sun-shine, or in an oven.

PRUNIFEROUS TREES, those with pretty large and fleshy fruit, with a nucleus in the middle, and called by botanists a drupe.

PRUNING, in gardening and agriculture, is the lopping off the superfluous branches of trees, in order to make them

bear better fruit, grow higher, or appear more regular.

There is not any part of gardening, which is of more general use than that of pruning; and yet it is very rare to see fruit-trees skilfully managed: and almost every gardener will pretend to be a master of this business, though there are but few who rightly understand it; nor is it to be learned by rote, but requires a strict observation of the different manners of growth of the several sorts of fruit-trees; some requiring to be managed one way, and others must be treated in a quite different method, which is only to be known from carefully observing how each kind is naturally disposed to produce its fruit: for some sorts produce their fruit on the same year's wood, as vines; others produce their fruits, for the most part, upon the former year's wood, as peaches, nectarines, &c. and others upon cuspis or spurs, which are produced upon wood of three, four, or five, to fifteen, or twenty years old, as pears, plums, cherries, &c. therefore, in order to the right management of fruit-trees, there should always be provision made to have a sufficient quantity of bearing wood in every part of the trees, and, at the same time, there should not be a superfluity of useless branches, which would exhaust the strength of the trees, and cause them to decay in a few years.

The reasons which have been laid down for pruning of fruit-trees, are as follow: first, to preserve trees longer in a vigorous bearing state; the second is, to render the trees more beautiful to the eye; and thirdly, to cause the fruit to be larger, and better tasted.

1. It preserves a tree longer in an healthy bearing state; for by pruning off all superfluous branches, so that there are no more left upon the tree than are necessary, or than the roots can nourish properly, the root is not exhausted in supplying useless branches, which must afterwards be cut out; whereby much of the sap will be uselessly expended.

2. By skilful pruning of a tree, it is rendered much more pleasing to the eye: but here I would not be understood to be an advocate for a sort of pruning which I have seen too much practised of late; viz. the drawing a regular line against the wall, according to the shape or figure they would reduce the tree to, and cutting all the branches, strong or weak, exactly to the chalked line; the absurdity of which practice will soon appear to every one

who will be at the pains of observing the difference of those branches shooting the succeeding spring. All therefore that I mean by rendering a tree beautiful, is, that the branches are all pruned according to their several strengths, and are nailed at equal distances in proportion to the different sizes of their leaves and fruit; and that no part of the wall, so far as the trees are advanced, be left unfurnished with bearing wood. A tree well managed, though it does not represent any regular figure, yet will appear very beautiful to the sight, when it is thus dressed, and nailed to the wall.

3. It is of great advantage to the fruit; for the cutting away all useless branches, and shortening all the bearing shoots, according to the strength of the tree, will render the tree more capable to nourish those which are left remaining, so that the fruit will be much larger, and better tasted. And this is the advantage which those trees against walls or espaliers have to such as are standards, and are permitted to grow as they are naturally inclined; for it is not their being trained either to a wall or espalier which renders their fruit so much better than standards, but because they have a less quantity of branches and fruit for their roots to nourish; and, consequently, their fruit will be larger, and better tasted.

There are many persons who suppose, that if their fruit-trees are but kept up to the wall or espalier, during the summer-season, so as not to hang in very great disorder, and in winter, to get a gardener to prune them, it is sufficient: but this is a very great mistake; for the greatest care ought to be employed about them in the spring, when the trees are in vigorous growth; which is the only proper season to procure a quantity of good wood in the different parts of the tree, and to displace all useless branches, as soon as they are produced, whereby the vigour of the tree will be intirely distributed to such branches only, as are designed to remain; which will render them strong, and more capable to produce good fruit; whereas, if all the branches are permitted to remain, which are produced, some of the more vigorous will attract the greatest share of the sap from the tree, whereby they will be too luxuriant for producing fruit, and the greatest part of the other shoots will be starved, and rendered so weak, as not to be able to produce any thing else but blossoms and leaves, as hath been before mentioned;

so that it is impossible for a person, let him be ever so well skilled in fruit-trees, to reduce them into any tolerable order by winter pruning only, if they are wholly neglected in the spring.

There are others, who do not intirely neglect their trees during the summer-season, as those before mentioned; but yet do little more good to them by what they call summer pruning; for these persons neglect their trees at the proper season, which is in April and May, when their shoots are produced, and only about Midsummer go over them, nailing in all their branches, except such as are produced fore-right from the wall, which they cut out; and at the same time often shorten most of the other branches; all which is entirely wrong practice; for those branches which are intended for bearing the succeeding year, should not be shortened during the time of their growth, which will cause them to produce two lateral shoots from the eyes, below the place where they were stopped, which shoots will draw much of the strength from the buds of the first shoot, whereby they are often flat, and do not produce their blossoms; and if those two lateral shoots are not intirely cut away at the winter pruning, they will prove injurious to the tree, as the shoots which these produce will be what the French call water-shoots: and in suffering those luxuriant shoots to remain upon the tree until Midsummer, before they are displaced, they will exhaust a great share of the nourishment from the other branches, as was before observed; and by shading the fruit all the spring-season, when they are cut away, and the other branches fastened to the wall, the fruit, by being so suddenly exposed, will receive a very great check, which will cause their skins to grow tough, and thereby render them less delicate. This is to be chiefly understood of stone-fruit and grapes; but pears and apples, being much hardier, suffer not so much, though it is a great disadvantage to those also, to be thus managed.

It must also be remarked, that peaches, nectarines, apricots, cherries, and plums, are always in the greatest vigour, when they are the least maimed by the knife; for, where these trees have large amputations, they are very subject to gum and decay; so that it is certainly the most prudent method carefully to rub off all useless buds when they are first produced, and pinch others, where new shoots are wanted.

wanted to supply the vacancies of the wall; by which management trees may be so ordered, as to want but little of the knife in winter pruning, which is the surest way to preserve these trees healthful, and is performed with less trouble than the common method.

The management of pears and apples is much the same with these trees in summer; but in winter they must be very differently pruned: for, as peaches and nectarines do, for the most part produce their fruit upon the former year's wood, and therefore must have their branches shortened according to their strength, in order to produce new shoots for the succeeding year; so pears, apples, plums, and cherries, on the contrary, producing their fruit upon cufons or spurs, which come out of the wood of five, six or seven years old, should not to be shortened, because hereby those buds which were naturally disposed to form these cufons, or spurs, would produce wood-branches, whereby the trees would be filled with wood, but never produce much fruit; and as it often happens, that the blossom-buds are first produced at the extremity of the last year's shoot, so, by shortening the branches, the blossoms are cut away, which should always be carefully avoided.

There are several authors who have written on the subject of pruning in such a prolix manner, that it is impossible for a learner to understand their meaning; these have described the several sorts of branches, which are produced on fruit-trees, as wood branches, fruit-branches, irregular branches, false branches, and luxuriant branches; all which they assert, every person who pretends to pruning, should distinguish well: whereas there is nothing more in all this but a parcel of words to amuse the reader, without any real meaning; for all these are comprehended under the description already given of luxuriant or useless branches, and such as are termed useful fruit-bearing-branches: and, where due care is taken in the spring of the year, to displace these useless branches, as was before directed, there will be no such thing as irregular, false, or luxuriant branches, at the winter pruning; therefore it is to no purpose to amuse people with a cant of words, which, when fully understood, signify just nothing at all.

The following hints will be of great use in pruning standard-trees.

First, you should never shorten the branches of these trees, unless it be where

they are very luxuriant, and grow irregular on one side of the tree, attracting a great part of the sap of the tree, whereby the other parts are unfurnished with branches, or are rendered very weak; in which case the branch should be shortened down as low as is necessary, in order to obtain more branches, to fill up the hollow of the tree: but this is only to be understood of pears and apples, which will produce shoots from wood of three, four, or more years old; whereas most sorts of stone fruit will gum and decay, after such amputations.

But from hence I would not have it understood, that I would direct the reducing of these trees into an exact spherical figure, since there is nothing more detestable than to see a tree, which should be permitted to grow as it is naturally disposed, with its branches produced at proportionable distances, according to the size of the fruit, by endeavouring to make it so exactly regular at its head, so crowded with small weak branches as to prevent the air from passing between them, which will render it incapable to produce fruit. All that I intend by this stopping of luxuriant branches, is only when one or two such happen on a young tree, where they entirely draw all the sap from their weaker branches, and starve them: and then it is proper to use this method, which should be done in time, before they have exhausted the roots too much.

Whenever this happens to stone-fruit, which suffer much more by cutting than the former sorts, it should be remedied by stopping or pinching those fruits in the spring, before they have obtained too much vigour; which will cause them to push out side branches, whereby the sap will be diverted from ascending too fast to the leading branch, as has been directed for wall-trees; but this must be done with caution, as before.

You must also cut out all dead or decaying branches, which cause their head to look very ragged; especially at a time when the leaves are upon the tree: these being destitute of them, have but a despicable appearance; besides, these will attract noxious particles from the air, which are injurious to the trees; therefore the sooner they are cut out the better: in doing of this you should observe to cut them close down to the place where they were produced, otherwise that part of the branch left will decay, and prove equally hurtful to the tree; for it seldom happens, when a branch begins to decay,

decay, that it does not die quite down to the place where it was produced; and, if permitted to remain long uncut, does often infect some of the other parts of the tree. If the branches are large which you cut off, it will be very proper, after having smoothed the cut part exactly even with a knife, chissel, or hatchet, to put on a plaster of grafting clay, which will prevent the wet from soaking into the tree at the wounded part.

All such branches as run across each other should also be cut out; for these not only occasion a confusion in the head of the tree, but by lying over each other, rub off their bark by their motion, and very often occasion them to canker, to the great injury of the tree; and on old trees, especially apples, there are often young vigorous shoots from the old branches near the trunk, which grow upright into the head of the trees: these therefore should carefully be cut out every year, lest, by being permitted to grow, they fill the tree too full of wood; which should always be guarded against, since it is impossible for such trees to produce so much, or so good fruit, as those trees whose branches grow at a farther distance; whereby the sun and air freely pass between them, in every part of the tree. *Miller's Gard. Dict.*

* PRUSSIA, a kingdom of Europe, is seated near the Baltic Sea, and extends 250 miles along the coast. It is bounded on the S. by Poland; on the E. by Lithuania; on the N. by the Baltic Sea; and on the W. by Brandenburg, Pomerania, and Cassubia. It is divided into Regal Prussia, Polish Prussia, and Ducal Prussia, the last of which was erected into a kingdom by the emperor Leopold, in 1706, in favour of Frederick III. margrave of Brandenburg. It is a very fertile country, and produces more flax, hemp, and corn than the inhabitants can consume. The tame cattle are very numerous, game very plenty, and the sea and lakes yield abundance of fish. There are in the forests wild asses, and an animal of the ox kind called a urus. One of the most remarkable productions of this country is yellow amber, which is fished for on the sea-coasts, particularly near the circle of Samland. There are here two great lakes, and two large rivers, the Vistula and Pregel. The inhabitants are laborious, robust, able to undergo fatigue, and excellent soldiers. There are a great number of mechanics; but the principal business of the inhabi-

tants is husbandry and feeding of cattle. Polish Prussia comprehends four provinces, namely, the palatinate of Pomerania, whose capital is Dantzic; the palatinate of Culm, whose principal place is Thorn; the palatinate of Marienburg, whose principal town is of the same name; and the territory of Wermia, whose chief place is Braunsburg. Regal Prussia is divided into three circles, Samland, Natangen, and Hockerland, and each of these contains three small provinces. The capital town of Samland, is Coningsburg; of Sclavonia, Memel; and of Nardia, Labiau. This country is under the direction of a governor appointed by the king of Prussia, assisted by four great officers. The religion is generally protestant, after the confession of Augsberg; but there are some Calvinists and Roman Catholics. There are two orders of knighthood; the first of which is the Black Eagle, instituted by Frederick 1st in 1701, the day before his coronation. The chain of this order is composed of cyphers of the king's name mixed with eagles. The mark of the order is a star with eight points, enamelled with azure; and in the middle are the letters F. R. At the four corners of the escutcheon are four spread eagles. The ribband is orange, which is a symbol of the house of Orange. The knights have an embroidered star on their breasts, in the center of which is a black eagle, holding a laurel crown in his claw. Their number is never to exceed thirty. The other order is that of Merit, founded by his present majesty Frederic the third, in 1740. The mark is a golden cross with eight points, enamelled with azure; and on the uppermost point is the letter F. crowned; on the three lowermost points the motto is "FOR MERIT." This star is fixed to a black ribband, which they put about their necks, and it hangs down to their breasts.

PRUSSIAN-BLUE, among painters, &c. is prepared by precipitating a solution of green vitriol and alum with a lixivium drawn from fixed alkaline salt that has been calcined with animal coals. Commonly about three parts of alkali and two of dried ox-blood are calcined so long as any flame appears, then thrown into boiling water, and the strained decoction poured into a hot mixture of solutions of four parts of alum, and one of less of vitriol. The liquor becomes instantly thick or cordy, and looks at first of a greyish colour, which changes to a brown,

brown, and in a little time to a bluish green. The matter being well stirred together, and mixed with a quantity of hard spring water, a green precipitate subsides: spirit of salt poured upon the edulcorated powder, dissolves a part, and leaves the rest blue.

Mr. Geoffry is the best who has given a plausible theory of this process, or any rational means for improving it. He observes, that the Prussian blue is no other than the iron of the vitriol, revived by the inflammable matter of the alkaline lixivium, and perhaps brightened by an admixture of the white earth of the alum; the green colour proceeds from a part of the yellow ferrugineous calx or ochre unrevived, mixing with the blue; and that this spirit of salt dissolves this ochre more readily than the blue part, though it will dissolve that also by long standing, or if used in too large quantity. From these principles he was led to increase the quantity of inflammable matter, that there might be enough to revive the whole of the ferrugineous ochre, and produce a blue colour at once without the use of the acid spirit: in this he perfectly succeeded, and found at the same time, that the colour might be rendered of any degree of deepness or lightness at pleasure. If the alkali is calcined with twice its weight of dried blood, and the lixivium obtained from it poured into a solution of one part of vitriol to six of alum, the liquor acquires a very pale blue colour, and deposits as pale a precipitate: on adding more and more of a fresh solution of vitriol, the colour becomes deeper and deeper, almost to a blackness. He imagines with great probability, that the blue pigment thus prepared will prove more durable in the air, mingle more perfectly with other colours, and be less apt to injure the lustre of such things as are mixed or applied in its neighbourhood, than that made in the common manner; the tarnish and other inconveniences to which common Prussian blue is subject, seeming to proceed from the acid spirit, which cannot be totally separated by any ablution. He takes notice of an amusing phenomenon, which happens upon mixture. When the liquors are well stirred together, and the circular motion as soon as possible stopped: some drops of solution of vitriol, depurated by long settling, let fall on different parts of the surface, divide, spread, form curious representations of flowers, trees, shrubs, flying insects, &c.

in great regularity and perfection: these continue ten or twelve minutes; and on stirring the liquor again, and dropping in some more of the solution of vitriol, are succeeded by a new picture.

Mr. Macquer has ingeniously applied the preparation of this pigment to the dying of wool and silk; and found means of fixing the blue secula in their pores. By dipping cloth first in a diluted solution of vitriol and alum, then in the ley diluted, and afterwards in water acidulated with spirit of vitriol, it acquires a light blue colour; which becomes deeper and deeper on repeating the dippings alternately in the same order as before; and adding to the liquors each time a little more of the respective saline matters. This blue dye, he says, in beauty and lustre exceeds that of indigo and woad as far as scarlet does the madder red; and penetrates the whole substance of fullest cloth, without weakening it. The colour is durable in the air, and stands boiling with alum water, but is discharged by soap, and without certain precautions, liable to be specky and unequal. See the *Memoirs of the French Academy for the year 1749*.

PSALM, a divine song or hymn; but chiefly appropriated to the hundred and fifty Psalms of David, a canonical book of the Old Testament. Most of the Psalms have a particular title, signifying either the name of the author, the person who was to set it to music or sing it, the instrument that was to be used, or the subject and occasion of it. Some have imagined, that David was the sole author of the Book of Psalms; but the title of many of them prove the contrary, as Psalm xix. which appears to have been written by Moses. Many of the Psalms are inscribed with the names Korah, Jeduthun, &c. from the persons who were to sing them. Psalm lxxii. and cxxvii. are under the name of Solomon, the former being composed by David for the use of his son, and the latter being probably composed by Solomon himself. The authority and canonicalness of the book of Psalms has always been acknowledged, both by Jews and Christians. However, nothing can be a greater argument of its obscurity, than the great number of commentaries upon them.

PSALMODY, the art or act of singing psalms.

PSALTER, the same with the book of Psalms.

PSALTERY, a musical instrument.
much

much in use among the ancient Hebrews, who call it nebel.

PSEUDO, from ψευδς, a Greek term used in the composition of many words, to denote false or spurious; as the pseudo-acacia, or bastard acacia; pseudo-fumaria, or bastard-fumitory; pseudo-ruta, or bastard rue, &c.

PSOAS, in anatomy, the name of two muscles, distinguished by the epithets magnus and parvus. The psoas magnus is one of the flexor muscles of the thigh, and arises from the first, second, third, and fourth vertebræ of the loins. The psoas parvus is one of the flexor muscles of the loins, which arises by a slender tendon from the os pubis, where it is joined to the ilium; and is inserted into the side of the upper vertebræ of the loins; it is often wanting, and when found, its office is to assist the quadratus in elevating the ossa innominata, especially when we lie down.

* **PSYCHE**, in fabulous history, was a favourite of Cupid, whose marriage with her has been celebrated by the poets. Psyche in Greek signifies soul. She was represented with the wings of a butterfly fixed to her shoulders; for the butterfly was esteemed the emblem of the soul, and therefore when the Greeks painted a dead body, they represented a butterfly which seemed to have escaped from its mouth into the air.

PSYCHOLOGY, ψυχολογια, that branch of anthropology which treats of the soul, its faculties, passions, &c.

PSYCHOMANCY, ψυχαμαντια, a kind of a divination, performed by raising the souls of persons deceased.

PSYCHROMETER, an instrument for measuring the degrees of coldness or heat in the air, and more usually called thermometer. See *Thermometer*.

PTERYGOIDE, something resembling a wing; from a resemblance to which, four apophyses or processes of the os sphenoides have been called pterygoide.

PTERYGOIDÆUS, in anatomy, the name of two muscles of the lower jaw, one internal and the other external. The internal pterygoideus muscle has its origin in the cavity of the pterygoide process, and its termination is in the interior and lower superficies of the angles of the jaw. The external pterygoideus arises from the exterior lamina of the same process, and terminates a little above the insertion of the other.

There are also several pairs of muscles

of the pharynx and uvula, as the pterygo-pharyngeus, and pterygo-staphylinus, which have got their names from being connected by the same process. The pterygo-staphylinus arises from the upper part of the said process, and descending between its two lamellæ, turns back its tendon over the thin apophysis of the interior lamella, as over a pulley, to the interior part of the membrane of the palate, into which it is inserted, and serves to draw the uvula downwards and forwards.

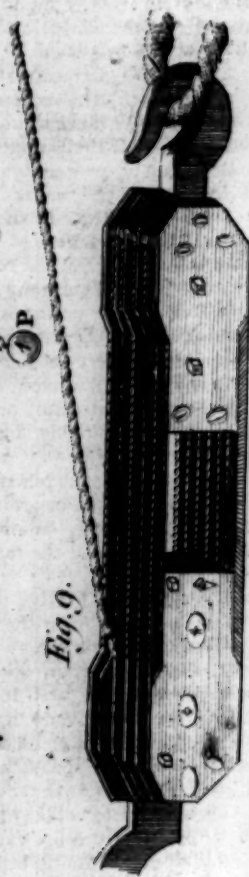
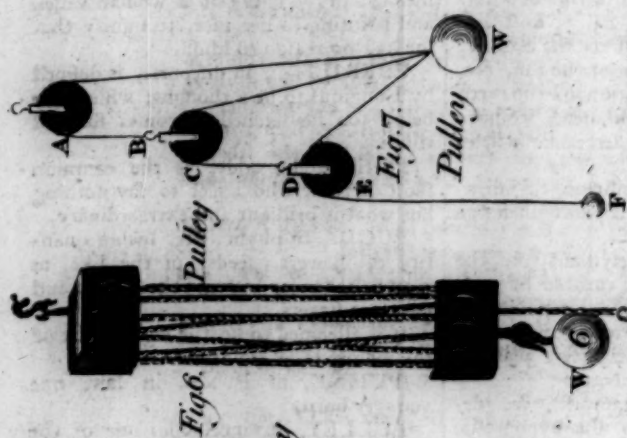
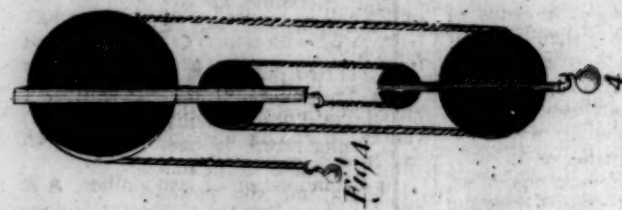
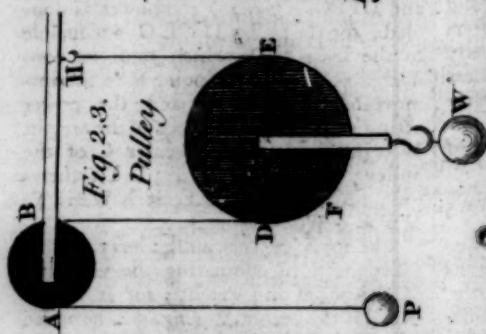
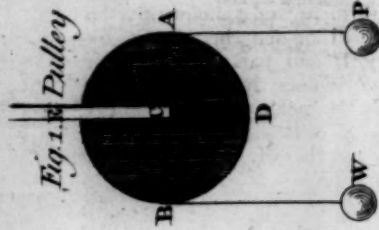
PTOLEMAIC, or **PTOLEMEAN** System of Astronomy, is that invented by Claudius Ptolemæus, a celebrated astronomer and mathematician of Pelmisium, in Egypt, who lived in the beginning of the second century of the Christian æra. This hypothesis supposes the earth immovably fixed in the center, not of the world only, but also of the universe; and that the sun, the moon, the planets, and stars all move about it, from east to west, once in twenty-four hours, in the order following, viz. the moon next to the earth, then Mercury, Venus, the Sun, Mars, Jupiter, Saturn, the fixed stars, the first and second crystalline heavens, and above all the fiction of their primum mobile.

This system or hypothesis was first invented, and adhered to, chiefly because it seemed to correspond with the sensible appearances of the celestial motions. They took it for granted, that the motions which these bodies appeared to have, were such as they truly and rectly performed: and not dreaming of any motion in the earth, nor being apprized of the distinction of absolute and relative or apparent motion, they could not make a proper judgment of such matters; but were under a necessity of being misled by their senses, for want of the assistances we now enjoy.

It is easy to observe, they had no notion of any other system but our own, nor of any other world but the earth on which we live. They imagined that all the fixed stars were contained in one concave sphere, and that the primum mobile was circumscribed by the empirical heaven, of a cubic form, which they supposed to be heaven, or the blissful abode of departed souls.

It would scarce have been worth while to have said so much about so absurd an hypothesis, as this is now well known to be, were it not that there are still numerous retainers thereto, who endeavour very





very zealously to defend the same, and that for two reasons principally, viz. because the earth is apparently fixed in the center of the world, and the sun and stars seem to move about it daily; and also because the Scripture asserts the stability of the earth, the motion of the sun, &c. But that the diurnal motion of the earth occasions all these appearances, we have abundantly proved under the articles *Diurnal* and *Copernician*.

PTYALISM, in medicine, a salivation, or frequent and copious discharge of saliva.

PUBERTY, among civilians, &c. the age wherein a person is capable of procreation, or begetting children. Boys arrive at puberty at fourteen years of age, and girls at twelve; eighteen years of age is accounted full puberty.

PUBES, among anatomists, &c. denotes the middle part of the hypogastric region of the abdomen, lying between the two inguina or groins.

PUBLICAN, among the Romans, one who farmed the taxes and public revenues.

PUBLICATION, the act of making a thing known to the world; the same with promulgation.

PUCERON, in zoology, a genus of wingless insects with fewer than six pair of legs. The body is short and roundish; the tail is crooked and forked; the legs are three pairs, and serve only for walking; and the eyes are two, but each composed of eight lesser ones.

The pucerons are extremely numerous, living on the young branches of trees and plants; and often found in such clusters as wholly to cover them: they are usually denominated from the trees and places where they are found; there being scarce a vegetable, either in the fields or gardens, that has not a peculiar species of puceron to feed on its juices.

PUDENDA, the parts of generation in both sexes. See *Generation*.

* **PUDICITIA**, in pagan worship, one of the virtues to which the Romans erected temples and altars. Pudicitia, or Chastity, was honoured at Rome under two names. In the temple of Pudicitia Patricia none were admitted but ladies of noble birth; but Virginia, the daughter of Aulus, marrying a Plebeian, so exasperated the ladies, that she was excluded from their assemblies, when Virginia, calling together the Plebeian matrons, dedicated a temple to Pudicitia Plebeia. In both these temples no nation was per-

mitted to sacrifice, who had not an unblemished character, and was but once married. Pudicitia is represented, on medals, in the figure of a woman veiled and pointing to her face, to signify that she had no reason to blush.

PUERILITY, in discourse, is defined by Longinus to be a thought, which, by being too far-fetched, becomes flat and insipid.

Puerility, he adds, is the common fault of those who affect to say nothing but what is brilliant and extraordinary.

PUGIL, in physic, &c. such a quantity of flowers, seeds, or the like, as may be taken up between the thumb and two fore-fingers.

It is esteemed to be the eighth part of the manipule or handful.

PUISNE, or **PUNY**, in law, one younger born.

PULLEY, in mechanics one of the five mechanical powers, called by the Latins *tróchlea*, and by the seamen a tackle.

If **A D B E** (plate XLIV. *fig. 1.*) be a pulley upon which hang the weights **P W**; then since the nearest distances of the strings **A P** and **B W**, from the center of motion **C**, are **A C** and **B C**, the pulley will be reduced to the lever or balance **A B**, with respect to its power; and from thence it appears that, since **A C = B C**, we shall always have **P = W**, for an equilibrium; and, therefore, no advantage in raising a weight, &c. can be had from a single pulley.

In a combination of two pulleys, **A B** and **D F E G**, (*fig. 2.*) the power is doubled; for the pulley **D F E G** is reducible to the lever **E D**, which must be considered as fixed in the point **E** to the immoveable string **H E**; and the power acting at **D** is equal to **P**, and the weight **W** is sustained from the center **C** of the pulley; but **P : W :: C E : D E**; therefore, since **D E = 2 C E**, it is **W = 2 P**, or **P = $\frac{1}{2}$ W**.

The force of the pulleys may also be easily shewn by comparing the velocities of the power and weight; for it is evident, if the weight **W** (*fig. 3.*) be raised one inch, each string **H E**, **D B**, will be shortened one inch, and consequently the string **A P** will be lengthened two inches; and so **P** will pass through twice the space that **W** does, in the same time; consequently the tackle of pulleys, in the form of *fig. 4.* will increase the power five times; and that of *fig. 5.* and *6* will increase it six times.

In the disposition of pulleys, according to fig. 8. it is plain, since each pulley has a fixed rope, it must be considered as a lever of the second sort, and so will double the power of the fore-going pulley; and so four pulleys will increase the power sixteen times.

Tho' the last-mentioned form be of the greatest force from the same number of pulleys; yet, if we consider the simplicity, force, and conveniency of the tackle of pulleys altogether, none is superior to that of the form of fig. 7. where the uppermost pulley is fixed, and each has a rope annexed to the weight; its power therefore is thus estimated: when the weight *W* is raised one inch, the rope *A B* will be lengthened as much, and so the pulley *C* will descend one inch, by which means the rope *C D* will be lengthened two inches, and one by the rising of the weight *W*; wherefore the pulley *E* will descend three inches; and thus the rope *E P* will be lengthened six inches by that means (viz. three on each side); also, the rising of the weight will cause it to lengthen one inch more, so that the power *P* goes through seven inches, while the weight *W* rises one: therefore *P* : *W* :: 1 : 7. And thus you proceed for any other number.

The following curious and useful combination of pulleys is given by the ingenious Mr. Smeaton in the XLVIIIth Vol. of the *Philosophical Transactions*.

The present method of arranging pulleys in their blocks may be reduced to two. The first consists in placing them one by the side of another, upon the same pin; the other in placing them directly under one another, upon separate pins. But in each of these methods an inconvenience arises, if above three pulleys are framed in one block. For, according to the first method, if above six pulleys are placed by the side of one another, as the last line, by which the draught is made, or, as it is usually called, the fall of the tackle, must necessarily be on the outside pulley or shieve, the difference of their friction will give it so great a tendency to pull the block away, that as much will be lost by the rubbing of the shieves against the block, on account of its obliquity, as will be got by increasing the number of lines.

The second method is free from this objection: but as the length of the two blocks, taken together, must be equal to the sum of the diameters of the six pulleys, besides the spaces between for the

ropes, and the necessary appendages of the framing, were there more than three pulleys in each block, they would run out into such an inconvenient length, as to deduct very considerably from the height, to which the weight might otherwise have been raised; so that upon those accounts, no very great purchase can be made by the common tackles of pulleys alone.

In order therefore to increase its power, sometimes a second tackle is fixed upon the fall of the first; but here it is obvious, that, whatever be the power of the second tackle, the height to which the weight might otherwise have been raised by the first, will be less in the same proportion as the purchase is increased by the second.

Again, very frequently the fall of the first tackle is applied to an axis in peritrochio, which increases the purchase very commodiously without the inconveniences last mentioned; but then the machine is rendered cumbersome, and; consequently, less fit for a moveable apparatus.

All those impediments I have avoided, by combining the two methods, above described, in one. The pulleys are here placed in each block in two tier; several being upon the same pin as in the first method, and every one having another under it, as in the second; as also that, when the tackle is in use, the two tier, that are the remotest from one another, are so much larger in diameter than those that are nearest, as to allow the lines of the former to go over the lines of the latter without rubbing.

From this construction arises a new method of reeving the line upon the shieves: for here, let the number of shieves be what it will, the fall of the tackle will always be upon the middle shieve, or on that next the middle, according as the number of pulleys on each pin is odd or even.

To do this the line is fixed to some convenient part of the upper block, and brought round the middle shieve of the larger tier of the under block; from thence round one of the same sort, next the center one of the upper block; and so on till the line comes to the outside shieve, where the last line of the larger tier falls upon the first shieve of the smaller, and being reeved round those, till it comes at the opposite side, the line from the last shieve of the smaller tier again rises to the first of the larger, where it

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it is conducted round, till it ends on the middle shieve of the upper block on the larger tier, as will appear more plain, by inspection of Plate XLIV. *fig. 9.*

In this method all the lines are clear of one another, and the blocks are kept parallel. The model which I had the honour to shew the Society, and from which I made the draught, is a composition of twenty shieves, five on each pin. With this model, which may be easily carried in the pocket, I have raised 600 weight. But with a tackle of this sort, properly executed in large, one man will easily raise a ton, and a greater number in proportion.

I have tried several numbers of shieves as far as 36; but 20 seems to be the largest number, that will answer well in practice.

A very commodious tackle of twelve might be executed in wood, in the same manner that common blocks are made.

PULMONARY Vessels, in anatomy, arteries and veins, which carry the blood from the heart to the lungs, and back again from the lungs to the heart.

PULP, in pharmacy, the fleshy and succulent part of fruits, extracted by infusion or boiling, and passed through a sieve.

Some physicians use the term pulp for the fattest, fullest, and most solid part of the flesh of animals.

PULPIT, an elevated place in a church, from which sermons are delivered; the French give the same name to a reading-desk.

PULSE, in the animal œconomy, denotes the beating or throbbing of the heart and arteries. See *Heart* and *Artery*.

No doctrine has been involved in more difficulties than that of pulses; since, in giving a physiological account of them, physicians have espoused quite opposite sentiments; whilst some doubt whether the pulse is owing to the systole or diastole; as also, whether the motion of the heart, and arteries, is one and the same, for a moment of time. See *Systole* and *Diastole*.

The pulses of persons differ according to the largeness of the heart and vessels, the quantity and temperies of the blood, the elastic force of the canals; as also with regard to the sex, age, season, airy motion, food, sleep, watchings, and passions of the mind. The pulse is larger and more quick in men than in

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women; in the bilious and sanguineo-bilious, than in the phlegmatic and melancholic. Those who are lean, with tense fibres, and larger vessels, have a greater and a stronger pulse than those that are obese, with lax fibres and small vessels; whence they are more healthy, robust, and apt for labour. In children, the pulse is quick and soft; in adults, greater and more violent. In the old, it is commonly great, hard, and slow. Labour, motion, and exercise of the body, increase the circulation of the blood, the excretions, and particularly respiration; rest renders the circulation slow and weak; intense speaking increases the circulation, and consequently renders the pulse large and quick. In watching, the pulse is more evident; in sleep more slow and languid. After drinking hot things, such as coffee and tea, or hot bath-waters, as well as after meals, the pulse vibrates more quick. But nothing produces a greater change in the pulse than affections of the mind; in terror it is unequal, small and contracted; in joy, frequent and great; in anger, quick and hard; in sadness, slow, small, deep, and weak; and in intense study, languid and weak. With regard to the air, when after the predominancy of a west or south wind, it becomes north or east, the pulse is stronger and larger; as also when the quicksilver rises in the barometer. But when the atmosphere is dense, humid, rainy, with a long south wind; as also where the life is sedentary, the sleep long, and the season autumnal, the pulse is languid and small, and the perspiration decreased. In May it is great, and sometimes violent; in the middle of summer, quick but weak; in the autumn, slow, soft, and weak; in the winter, hard and great. A drastic purge and an emetic render the pulse hard, quick and weak, with loss of strength; chalybeates, and the bark, render it great and robust, and the complexion lively; volatiles, amplify and increase the pulse; acids and nitrous remedies refrigerate the body, and appease the pulse; opiates and the like render it small and weak, and decrease the elasticity of the solids; whereas things abounding with a friendly sulphur increase the pulse; but poisons render it small, contracted, and hard. When the quantity of the blood is too great, bleeding raises the pulse.

The several indications of the pulse in different

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different disorders, may be seen under the respective names of these diseases.

PULSE is also used for the stroke with which any medium is affected by the motion of light, sound, &c. through it.

PULSE, in botany, a term applied to all those grains or seeds which are gathered with the hand, in contradistinction to corn, &c. which are reaped, or mowed; or it is the seeds of the leguminous kind of plants, as beans, vetches, &c. but it is by some used for artichokes, asparagus, &c.

* PULTNEY, William, esq; afterwards created earl of Bath, was descended from one of the most ancient families in the kingdom, was born in the year 1682. Having a plentiful fortune, he sat early in the house of commons, and was a warm partizan against the ministry in the reign of queen Anne, whose errors he detected with a spirited eloquence. In 1714, George 1st. ascending the throne, made him secretary at war; and soon after he was raised to be cofferer to his majesty's household; but the intimacy which had subsisted between him and Mr. Walpole, who was then as prime minister, was soon interrupted by its being suspected, that Sir Robert wanted to extend the limits of prerogative, therefore an irreconcilable breach between the two ministers ensued. Mr. Pultney opposed all Sir Robert's measures, so that some have been of opinion, that he frequently carried his opposition to such a length, as to exert himself against him, even when the measures he pursued were beneficial to the public. This rendered him so obnoxious to the crown, that in July, 1731, George II. called for the council-book, and with his own hand struck the name of William Pultney, esq; out of the list of privy counsellors; his majesty farther ordered him to be put out of all commissions for the peace; the several lord lieutenants, from whom he had received deputations, were commanded to revoke them; and the lord-chancellor and secretaries of state were directed to give the necessary orders for that purpose. This only inflamed Mr. Pultney's resentment, and increased his popularity. He continued to attack the measures of the minister with an inflexible severity, and with a degree of eloquence and sarcasm, that frequently worsted his antagonists; and though Sir Robert seldom lost his temper, and generally answered him very calmly; it is

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said, that he more than once observed, "that he dreaded his tongue more than another man's sword." In 1738, when opposition ran so high that several members openly left the house, on finding that Sir Robert's party carried every motion, Mr. Pultney vindicated the extraordinary steps they had taken; and when a motion was made for removing Sir Robert, he warmly supported it. In 1741, Sir Robert found his place no longer tenable, he prudently resigned all his employments, and was created earl of Oxford. His opposers, among whom Mr. Pultney was the chief, were assured of being provided for; Mr. Pultney was accordingly sworn of the privy-council, and soon after created earl of Bath. He had long lived in the summit of popular applause; but from the moment he accepted a title, he lost all his favour with the people. He died without issue on the 8th of June 1764, and his title became extinct; but was succeeded in his estate by his brother, lieutenant-general Pultney, who is now also dead.

PULVERIZATION, the art of pulverizing, or reducing a dry body into a fine powder, which is performed in friable bodies, by pounding or beating them in a mortar, &c. but to pulverize malleable ones, other methods must be taken. To pulverize lead, or tin, the method is this: rub a round wooden box all over the inside with chalk; pour a little of the melted metal nimbly into the box; when, shutting the lid, and shaking the box briskly, the metal will be reduced to powder. See the article *Granulation*.

PULVIS *Fulminans*, among chemists, a powder, so called from its smart and loud explosion, when it begins to melt, after being placed upon an iron-plate over a gentle fire.

PUMICE, in natural history, a flag or cinder of some fossil, originally bearing another form, and only reduced to this state by the action of the fire, though generally ranked by authors among the native stones. It is a lax and spongy matter, frequently of an obscure, striated texture, in many parts, and always very cavernous and full of holes; it is hard and harsh to the touch, but much lighter than any other body that comes under the class of stones. It is found in masses of different sizes, and of a perfectly irregular shape, from the bigness of a pigeon's egg to that of a bushel.

PUMP, in hydraulics, a machine, formed

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formed on the model of a syringe, for raising water.

Air PUMP. See *Air Pump*.

Chain PUMP, a machine chiefly used on board large ships. It consists of two rollers, one fixed at the top, and the other at the bottom of the machine. Round these two rollers an endless chain, furnished with burs or small leather buckets, is fixed; and on one side is a tube or barrel exactly fitted to the burs, extending from the deck or place where the water is delivered, to the lower roller in the well. Both these rollers are ribbed, to prevent the chain from slipping, and the upper one has a double winch fixed to it. When this roller is turned round, the chain is drawn through the tube or barrel, and consequently causes the water to ascend with the buckets to the top of the tube, where it is discharged.

PUN, or *PUNN*, a conceit arising from the use of two words that agree in sound, but differ in the sense.

PUNCH, an instrument of iron or steel, used in several arts, for the piercing or stamping holes in plates or metals, &c. being so contrived as not only to perforate, but to cut out and take away the piece.

PUNCHEON, *PUNCHIN*, or *PUNCHION*, a little block, or piece of steel, on one end whereof is some figure, letter, or mark, engraved either in creux or relieve, impressions whereof are taken on metal, or some other matter, by striking it with a hammer on the end not engraved. There are various kinds of these puncheons used in the mechanical arts; such, for instance, are those of the goldsmiths, cutlers, pewterers, &c.

The puncheon, in coining, is a piece of iron steeled, whereon the engraver has cut in relieve the several figures, arms, effigy, inscription, that are to be in the matrices, wherewith the species are to be marked. Minters distinguish three kinds of puncheons, according to the three kinds of matrices to be made; that of the effigy, that of the cross or arms, and that of the legend, or inscription. The first includes the whole portrait in relieve; the second are small, each only containing a piece of the cross or arms, for instance, a fleur-de-lys, an harp, a coronet, &c. by the assemblage of all which the entire matrice is formed. The puncheons of the legend only contain each one letter, and serve equally for the legend on the effigy side and the cross side. See the article *Coining*.

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PUNCHEON is also used for several iron tools of various sizes and figures used by the engravers in creux on metals. Seal-engravers particularly use a great number for the several pieces of arms, &c. to be engraven; and many stamp the whole seal from a single puncheon.

PUNCHEON is also a common name for all those iron instruments used by stone-cutters, sculptors, blacksmiths, &c. for the cutting, incising, or piercing their several matters.

PUNCHEON, in carpentry, is a piece of timber placed upright between two posts, whose bearing is too great, serving, together with them, to sustain some large weights.

PUNCHEON is also used for the arbor or principal part of a machine, whereon it turns vertically, as that of a crane, &c.

PUNCHEON is also a measure for liquids, containing an hoghead and one third, or eighty-four gallons.

PUNCTUATION, in grammar, the art of pointing, or of dividing a discourse into periods by points expressing the pauses to be made in the reading thereof. See *Point*.

PUNCTUM SALIENS, in anatomy, the first rudiments of the heart in the formation of the fœtus, where a throbbing motion is perceived.

PUNCTURE, in surgery, any wound made by a sharp-pointed instrument.

PUNISHMENT, in law, the penalty which a person incurs on the breach or transgression of any law.

PUPIL, in the civil law, a boy or girl not yet arrived at the age of puberty, i. e. the boy under fourteen years, and the girl under twelve.

PUPIL is also used in universities, &c. for a youth under the education or discipline of any person.

PUPIL, in anatomy, a little aperture in the middle of the uvea and iris of the eye, through which the rays of light pass to the crystalline, in order to be painted on the retina, and cause vision.

• *PURCELL*, HENRY, a justly celebrated master of music, began early to distinguish himself. As his genius was original, it wanted but little forming, and he rose to the height of his profession with more ease than others pass through their rudiments. He was made organist to Westminster abbey in the latter end of the reign of Charles II. In that of king William, he set several songs for Dryden's *Amphytrion*, and his King Ar-

thur, or the British Worthy, which were received with just applause; and that great poet, who thought the defects of his own compositions abundantly supplied by those of Purcell, has pronounced him equal to the best masters of music abroad. His notes in his operas were admirably adapted to his words, and so echoed to the sense, that the sounds alone seemed capable of exciting those passions which they never failed to do in conjunction. His music was very different from the Italian. It was entirely English, and perfectly masculine. His principal works have been published under the title of *Orpheus Britannicus*. He died on the 21st of November 1695, in the thirty-seventh year of his age, and was interred in Westminster abbey, where a monument is erected to his memory.

PURCHASE, in law, the buying or acquiring of lands, &c. with money, by deed or agreement, and not by descent or right of inheritance.

PURE, something free from any admixture of foreign or heterogeneous matters: thus we say, pure fire, &c. See *Fire*, &c.

PURE HYPERBOLA, in conics, is an hyperbola without any oval, nodes, spike, or conjugate point.

PURFLEW, a term in heraldry, expressing ermins, peans, or any of the furs, when they compose a bordure round a coat of arms: thus they say, He beareth gules a bordure, purflew, vair: meaning that the bordure is vair.

PURGATIVE, or **PURGING MEDICINES**, a medicament which evacuates the impurities of the body by stool, called also cathartics.

PURGATORY, a place in which the just, who depart out of this life, are supposed to expiate certain offences which do not merit eternal damnation. Broughton has endeavoured to prove, that this notion has been held by Pagans, Jews, and Mahometans, as well as by Christians.

PURIFICATION, in matters of religion, a ceremony which consists in cleansing any thing from a supposed pollution or defilement.

PURIFICATION of the Blessed Virgin, a festival of the Christian church, observed on the second of February, in memory of the purification of Christ in the temple, and his mother's submitting to the Jewish law of purification, after the birth of a male child.

PURIFICATION, in chemistry, the

act of purifying or refining natural bodies by separating the faces and impurities from them.

PURIM, or *the Feast of Lots*, a solemn festival of the Jews, instituted in memory of the deliverance they received from Haman's wicked attempt to destroy them, by means of Mordecai and Esther.

PURITAN, a name formerly given in derision to the dissenters from the church of England, on account of their professing to follow the pure word of God, in opposition to all traditions and human constitutions.

PURLINS, in building, those pieces of timber that lie across the rafters on the inside, to keep them from sinking in the middle of their length.

PURLUE, or **PURLIEU**, signifies all that ground near any forest, which being made forest by king Henry II. Richard I. and king John, was afterwards by perambulations and grants of Henry III. severed again from the same, and made purlieu; that is to say, pure and free from the laws of the forest.

PURLUE-MAN, or **PURLIEU-MAN**, a person who has ground within the purlieu and is qualified to hunt within the same, though under certain restrictions.

PURPLE, a colour composed of a mixture of red and blue.

A beautiful transparent purple for painting may be made, by boiling four ounces of rasped Brasil wood in a pint of stale beer, and half an ounce of logwood, till the liquor is heightened to the colour you desire, which may be known by dipping a piece of paper in it. If you find it too red, add a quarter of an ounce more of logwood, which will render it still deeper, and by this method you may bring it to any degree of purple, by putting in either more or less logwood to the former composition, and fixing it with alum. This will produce such a clear purple as no mixture of reds and blues will produce. Madam Mariana, of Amsterdam, famous for painting in miniature, and for her excellent manner of illuminating prints, says, that the best purple that can be made, may be composed between the carmine and indigo; to strengthen which, on the red side, you may add lake, between the lighter and darker part: and so lake, when it is used in the same way, on the foregoing purple, produces a very fine effect.

PURPLE FEVER, the same with miliary fever. See *Fever*.

PURPURA,

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PURPURA, in natural history, a genus of simple shells, having no hinge, formed of one continuous piece, and covered from the top to the bottom with spines, tubercles, and umbos: the mouth is small, and approaches to a round figure: the clavicle is short, but the other extremity is usually protended to a considerable length.

PURPURE, **POURPRE**, or **PURPLE**, in heraldry, according to some, is one of the five colours of armories, compounded of gules and azure, bordering on violet, and according to others, of a great deal of red and a little black. But it was excluded by the ancient heralds as only an imperfect colour. In the coats of noblemen it is called amethyst; and in those of princes, mercury. It is represented in engraving, by diagonal lines drawn from the sinister chief to the dexter base point.

PURREL, a list ordained by act of parliament to be made at the end of kerseys, to prevent deceit in diminishing their length.

PURSIVENESS, among farriers, a disorder in horses, otherwise called broken wind, in which the horse makes a hissing whistling sound in his throat, and has a greater heaving in the flanks than in common colds.

PUS, in medicine, a white or yellowish putrid matter, formed of corrupted blood, and contained in a wound or ulcer.

PUSTULE, a pimple, or small eruption on the skin full of pus.

PULLOGS, or **PUTLOCKS**, in building, are short pieces of timber about seven feet long, used in building scaffolds. They lie at right angles to the wall, with one of their ends resting upon it, and the other upon the poles which lie parallel to the side of the wall of the building.

PUTREFACTION, a kind of slow corruption produced by heat and some moist fluid, particularly the air and water; which, penetrating the pores, dissolves and sets at liberty some of the more subtle parts, particularly the salts and oils, and thus loosens the compages, and changes the texture of bodies.

PUTRID, something rotten or putrefied.

PUTTY, the same with spodium. See *Spodium*.

PUTTY, in its popular sense, a kind of paste compounded of whiting and linseed oil, beaten together to the consistence of a thick dough. It is used by glaziers for the fastening in the squares of glass in

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sash-windows, and by painters for stopping up the crevices and clefts in timber and wainscots, &c.

PUTTY sometimes also denotes the powder of calcined tin, used in polishing and giving the last gloss to works of iron and steel.

PYCNOSTYLE, in the ancient architecture, is a building where the columns stand very close to each other; only one diameter and a half of the column being allowed for the intercolumniations.

According to Mr. Evelyn, the pycnostyle chiefly belonged to the Composite order; and was used in the most magnificent buildings; as at present in the peristyle at St. Peter's at Rome, which consists of near three hundred columns; and in such as yet remain of the ancients, among the late discovered ruins of Palmyra.

PYGME, the same with cubit. See the article *Cubit*.

PYGMY, a person not exceeding a cubit in height.

PYLORUS, in anatomy, the right or lower orifice of the stomach, which is connected with and opens into the intestines. See *Stomach* and *Intestines*.

PYRAMID, in geometry, a solid standing on a triangular, square, or polygonal basis, and terminating in a point at the top; or, according to Euclid, it is a solid figure, consisting of several triangles, whose bases are all in the same plane, and have one common vertex.

Hence the superficies of a given pyramid is easily found by measuring these triangles separately; for their sum added to the area of the base, is the surface of the pyramid required.

It is no less easy to find the solid content of a given pyramid; for the area of the base being found, let it be multiplied by the third part of the height of the pyramid, or the third part of the base by the height, and the product will give the solid content, as is demonstrated by Euclid, lib. 12. prop. 7.

If the solid content of a frustum of a pyramid is required, first let the solid content of the whole pyramid be found, from which subtract the solid content of the part that is wanting, and the solid content of the frustum, or broken pyramid will remain. See *Frustum*.

Every pyramid is equal to one third of its circumscribing prism, or that has the same base and height.

All pyramids are in a ratio compounded of their bases and altitudes; so that if their bases be equal, they are in proportion

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portion to their altitudes, and *vice versa*.

Equal pyramids reciprocate their bases and altitudes; that is, the altitude of one is to that of the other, as the base of the one is to that of the other.

PYRAMID, in architecture, a solid massive building, which from a square, triangular, or other base, rises diminishing to a vertex or point.

Pyramids are sometimes used to preserve the memory of singular events; and sometimes to transmit to posterity the glory and magnificence of princes. But as they are esteemed a symbol of immortality, they are most commonly used as funeral monuments. Such is that of Cestius at Rome, and those other celebrated ones of Egypt, as famous for the enormity of their size, as their antiquity. These are situated on the west side of the Nile almost opposite to Grand Cairo: the base of the largest covers more than ten acres of ground, and is, according to some, near seven hundred feet high, though others make it six hundred, and some but little more than five hundred. The pyramid is said to have been, among the Egyptians, a symbol of human life, the beginning of which is represented by the base, and the end by the apex; on which account it was, that they used to erect them over sepulchres.

PYRAMIDAL, relating to a pyramid.

PYRAMIDALIA CORPORA, in anatomy, the two protuberances of the medulla oblongata. The spermatic vessels are also by some authors thus termed.

PYRAMIDALIS, in anatomy, a small muscle in the abdomen lying in the lower part of the rectus. It has its name from its figure, and its origin from the margin of the os pubis, with a broad fleshy head, whence it grows gradually narrower, till it ends in a small round tendon in the linea alba, sometimes almost at the navel. This muscle is sometimes single, sometimes it has its fellow, and in some subjects they are both wanting.

PYRAMIDALIS is also the name of one of the dilatores, or muscles which serve to turn up the nose. This muscle rises at the foot of the nose, and is usually continuous with the frontalis. It descends along the side of the nose, where it is by degrees a little expanded. It is inserted into the ala of the nose, and often

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sends down its fibres as far as the upper lip.

PYRAMIDOID, the same with the parabolic spindle.

• **PYRAMUS**, in fabulous history, a youth of Babylon, who being in love with Thisbe, a beautiful nymph, and his neighbour, discovered the means of conversing with her through a chink in the wall, and thus eluded the vigilance of their parents, who disapproved their passion. But at length, being tired of this restraint, they resolved to steal by night from home, and to meet in the fields under a mulberry-tree, that grew by the side of a murmuring brook. Thisbe arrived first at the place, when a lioness, besmear'd with blood, came to drink at the neighbouring spring, which Thisbe seeing, sought for safety in flight; but dropping her veil, it was found by the beast, who tore it with her bloody jaws. Pyramus at length arrived, observed the prints of the savage feet, and finding the torn and bloody veil, plunged his sword into his body, when the blood streaming like a fountain from the wound on the mulberry-tree by which he stood, the berries, which were before white, were stained, and turned to a purple hue. Thisbe at length returned, saw the beloved body, embraced it in her arms, beheld him open his eyes, and expire: then seeing her veil and the sheathless sword, she plunged it in her bosom, and accompanied him in death.

PYRENOIDES PROCESSUS, in anatomy, a process of the second vertebra of the neck, called also odontoides, and dentiformis.

PYRETICS, medicines good against fevers. See *Fevers* and *Febrifuge*.

PYRIFORMIS, in anatomy, a muscle of the thigh, receiving its name from its figure, which resembles that of a pear. It rises thick from the lower part of the os sacrum, where it is joined to the ileum; from thence it runs transversely towards the joint of the hip, and terminates in a short tendon, which is inserted in the middle of the internal labium of the upper edge of the great trochanter, by two or three branches.

PYRITES, in natural history, a class of compound inflammable metallic bodies found in detached masses, but of no determinately angular figure. See *Copras*.

PYROMANCY, a kind of divination by means of fire. The ancients imagined they

they could foretel future events, by inspecting fire and flame; and to this end, they considered its direction, which way it turned: sometimes they added other matters to the fire, such as a vessel full of urine, having its neck bound about with wool, watching narrowly on which side it burst, and thence taking their augury: sometimes they threw pitch on it; and, if it took fire immediately, they esteemed it a good augury.

PYROTECHNY, the art of fire, or a science which teaches the management and application of fire in several operations. Pyrotechny is of two kinds, military and chemical: military pyrotechny is the doctrine of artificial fire-works and fire-arms, teaching the structure and use of those used in war, the attacking of fortifications, &c. as gun-powder, cannons, bombs, granadoes, carcasses, mines, fuses, &c. and those made for amusement-fake, as rockets, serpents, &c.

PYRRHICHIUS, in the Greek and Latin poetry, a foot consisting of two syllables, both short, as *deus*.

PYRRHONIANS, **PYRRHONEANS**, or **PYRRHONISTS**, a sect of ancient philosophers, so called from Pyrrho, a native of Elis, in Peloponnesus. The opinions of these philosophers, who were also called Sceptics, terminated in the incomprehensibility of all things, in which they found reason for both affirming and denying: accordingly they seemed, during their whole lives, to be in search of truth, without ever acknowledging that they had found it: hence the art of disputing upon all things, without ever going further than suspending our judgment, is called Pyrrhonism. Pyrrho maintained that life and death were equally indifferent; and he is charged with teaching, that honour and infamy, that justice and injustice of actions, depended solely on human laws and customs; and, in a word, that there is nothing in itself honest or dishonest, just or unjust: an abominable doctrine, that opens the way to all manner of crimes.

PYTHAGOREANS, a sect of ancient philosophers, so denominated from their being the followers of Pythagoras, of Samos, who lived in the reign of Tarquin, the last king of the Romans, in the year of Rome 220; or, according to Livy, in the reign of Servius Tullius, in the year of the world 3472.

Pythagoras, from his extraordinary desire of knowledge, travelled in order

to enrich his mind with the learning of the several countries through which he passed. He was the first that took the name of philosopher, that is, a lover of wisdom, which implied, that he did not ascribe the possession of wisdom to himself, but only the desire of possessing it. His maxims of morality were admirable: for he was for having the study of philosophy solely tend to elevate man to a resemblance of the Deity. He believed that God is a soul diffused through all nature, and that from him human souls are derived: that they are immortal, and that men need only take pains to purge themselves of their vices, in order to be united to the Deity. He made unity the principle of all things; and believed, that between God and man there are various orders of spiritual beings, who are the ministers of the Supreme Being. He condemned all images of the Deity, and would have him worshipped with as few ceremonies as possible. His disciples brought all their goods into a common stock, contemned the pleasures of sense, abstained from swearing, eat nothing that had life, and believed in the doctrine of a metempsychosis.

Pythagoras made his scholars undergo a very severe noviciate of silence for at least two years; and it is said, that where he discerned too great an itch for talking, he extended it to five: his disciples were therefore divided into two classes, of which the first were simple hearers, and the last such as were allowed to propose their difficulties, and learn the reasons of all that was taught them. The Pythagoreans, it is said, on their rising from bed, roused the mind with the sound of the lyre, in order to make them more fit for the actions of the day; and at night resumed the lyre, in order to prepare themselves for sleep, by calming all their tumultuous thoughts. The figurative manner in which he gave his instructions, was borrowed from the Hebrews, Egyptians, and other orientals. Some think he derived his philosophy from the books of Moses, and that he conversed with Ezekiel and Daniel at Babylon: but this is mere conjecture.

Some authors say, that he left nothing in writing; but Laertius and others attribute several treatises to him. His golden verses, attributed by some to one of his disciples, are allowed to be an exact copy of the sentiments of that Divine philosopher.

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Philosopher, from whose school proceeded the greatest philosophers and legislators.

PYTHIA, in antiquity, the priestess of Apollo at Delphi, by whom he delivered oracles: she was thus called from the god himself, who was denominated Apollo Pythios, from his slaying the serpent Python. This priestess was to be a pure virgin: she sat on the lid of a brazen vessel mounted on a tripod or three-legged stool; and thence, after a violent enthusiasm, delivered her oracles in a few ambiguous or obscure verses, or in a short sentence in prose. *See Oracle.*

PYTHIAN GAMES, in antiquity, solemn games celebrated near Delphi, in honour of Apollo, in remembrance of his having killed the serpent Python. These were held every two years, about the month Elaphebolion, which answered to our February. The celebration of these games was attended with the Pythian song, in which was celebrated the fight of

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Apollo and the serpent. The victors were crowned with branches of laurel; though, at the first institution, the crown was of beech-leaves.

* **PYTHON**, in fabulous history, a monstrous serpent, produced by the earth after Deucalion's deluge. Juno being exasperated at Latona, who was beloved by Jupiter, commanded this serpent to destroy her; but endeavouring to escape the monster, she fled to Delos, where she was delivered of Diana and Apollo, the latter of whom at length destroyed Python with his arrows, in memory of which victory the Pythian games were instituted. Some mythologists maintain that the word Python signifies putrefaction, and that this fable signifies no more than that the noxious vapours and exhalations which arose from the earth after the deluge were dispelled, and the air purified by the rays of the sun.

PYXIDIUM, **CUP-MOSS**, in botany.



END OF THE THIRD VOLUME

